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ABSTRACT

A curriculum for use with disadvantaged studerts in grades 5-8 provides a variety of "hands-on" experiences through which students can explore the world of work as it existed during the Colonial period. Activities relate to food, clothing, communication, and tool production. They use a range of skills and abilities and can be performed on an individual basis, in groups, or as class projects. The first three chapters suggest activities to clarify the meaning of "bicentennial" and America's Bicentennial; review events of the Colonial period and the historical years, 1770-1782; and provide field trips to museums holding Colonial collections. Four chapters on Colonial occupations contain a total of 24 activities with explicit objectives, lists of materials needed, and directions for each activity. Students make beef jerky, maple syrup, and soap; dye thread; make ink by boiling maple bark, then use a quill to write letters; and fashion corncob pipes, cowbells, and candleholders. In order to compare Colonial and modern production methods, students visit textile mills, food processors, and radio stations. Separate bibliographies of children's books and teacher references are provided, as well as a list of 10 films and filmstrips. (AV)

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State of New Jersey
Department of Education
Division of Vocational Education

BICENTENNIAL AWARENESS THROUGH SOCIAL STUDIES AND RELATED CAREERS

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Dr. Joseph F. Kelly

Project Director
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INTRODUCTION

This curriculum has been written for use with the disadvantaged student in grades five through eight. It can be used effectively in a variety of time schedules: 1) one period per week throughout the school year; 2) one or two periods per week for one semester; 3) one afternoon per week for one semester; 4) every afternoon for two months; 5) every day all day for one month, etc. In most instances, the sequence of use can be adapted to meet the needs of the teacher as well as those of the students. Also, only those lessons which are suitable need be used. In other words, each teacher can pick and choose the lessons which best fit his or her needs and the needs of the class as well as the order in which to teach them.

The American Bicentennial Celebration is used as a motivating point to promote interest in and to gain an understanding of our country's important historical events 200 years ago. By taking field trips, putting on skits, role playing, making charts, constructing shadow boxes, making bulletin boards, and map making, the student's understanding and appreciation of the general living conditions, lifestyles, skills, and attitudes as they existed in Colonial America will be made more meaningful.

Through a variety of "hands-on" experiences the student will explore the world of work as it existed during the colonial period, e.g. areas relating to food, clothing, communication, and

tool production. The "hands on" activities are greatly varied to provide experiences in a variety of mediums and to utilize a broad range of skills and abilities. In these lessons, the finished product serves as the evaluation. Each activity can be performed on an individual basis, in partnership, in groups, or as a class project.

In order to make a comparison of the colonial period with present day conditions, field trips are planned in areas relating to food, clothing, manufacturing and communication. A cumulative field trip log serves as an effective evaluation of these lessons.

A cross-referencing guide of academic subjects, lists the lessons in the areas of Language Arts, Mathematics, Social Studies, Science and Art.

CHAPTER I

UNDERSTANDING TERMS

This chapter introduces the term "bicentennial" as well as the purpose and concept of the American Bicentennial.

Lesson A. Understanding Terms -- Bicentennial

Objectives

Having access to the root words of each term, the student will define and illustrate words using the prefix "bi-".

Procedure

1. Present the student with a list of words using the prefix "bi", such as:

* biannual (occurring twice a year)
* bicentennial (relating to a 200th anniversary)
  bicentric (having two centers)
  biceps (a muscle having two heads)
  bichrome (two-colored)
  bicolor (two-colored)
  bicorn (two-horned: resembling a crescent)
  bicuspid (human tooth ending in two points)
  bicycle (two-wheeled vehicle)
* biennial (lasting two years)

bifacial (having two fronts or faces)

bifocal (having two focal lengths)

bilander (small two-masted merchant ship)

bilateral (affecting reciprocally two sides)

bilingual (two languages)

bilobed (having two lobes)

bimanual (requiring use of both hands)

bimetallic (composed of two different metals)

* bimillenary (two thousand years)

bimolecular (formed from two molecules)

* bimonthly (twice a month)

bimotored (equipped with two motors)

binocular (related to using both eyes)

binomial (having two names)

bipartisan (two parties)

biped (two-footed animal)

biplane (two-winged airplane)

bipod (two-legged stand)

biracial (two races)

bisect (divide into two equal parts)

bivalve (an animal with a two-valved shell, such as a clam)

* biweekly (twice a week)

* biyearly (twice a year)

bizone (related to two zones or areas)

2. Discuss briefly:

A. In what way are these words the same?

Answer: They all begin with "bi"

B. Choose one word that names one object and describe the object.

Answer: Bicycle. Something you ride that has two wheels, seat, and handlebars.

C. If "cycle" means circle or wheel, what does "bi" mean in the word bicycle?

Answer: two.

D. Would this give you a clue as to the meaning of the other words on the list?

Answer: "Bi" means two. Each word means two of something or two things.

3. Discuss the meaning of the root or base word of all or most words on the list except those dealing with time. (Use any or all of the three presentation methods that follow).

A. If ped relates to feet, what is the meaning of biped?

Answer: Two-footed.

B. If we talk about a bimotored ship, what do we know about the ship?

Answer: It has two motors.

C. Binoculars relate to the use of two of something. What are they?

Answer: Eyes.

4. Explain that some of the terms are related to time (see asterisk). Define and discuss the meaning of all or most.

Evaluation

Having access to the meaning of the root word and help in rereading the words, the student will illustrate one of the following:

bifocals used bimanually

bichrome bicuspids

bimotored bilander

bisected bivalve

bicolored bicycle

biracial and bilingual boys

bimetallic binoculars

binomial biplane

Lesson B. Defining Terms -- America's Bicentennial

Objectives

The student will apply his understanding of the term bicentennial to conclude that 1976 will be the 200th anniversary of the founding of America.

Procedure

1. Review meaning of the term bicentennial.
2. Discuss current events:
   A. Has anyone heard about celebrations that will take place in 1976 all over America?
   B. Where have you seen or heard about the Bicentennial celebration?
      Answer: Radio, TV, newspapers, magazines.
   C. If bicentennial means 200 years, how can we determine what year it was 200 years ago?
      Answer: Subtract 200 from 1976.
   D. Subtract 200 from 1976. What year is it?
      Answer: 1776.
3. Explain that 1976 will mark the 200th birthday of America. Americans all over the country will join in celebrations to reinact and remember the events that happened during that time.

Evaluation

As a class project or on an individual basis, the students will compile a scrapbook of articles from newspapers and magazines telling about plans for bicentennial celebrations around the country.

CHAPTER II

THE COLONIAL PERIOD

This chapter attempts to give a broad overview of America during the colonial period. The geographic setting, origins of colonies, and living conditions in general are presented to gain an understanding and appreciation of America 200 years ago. Three field trips are included in the lessons for this chapter.

Lesson A. Location of the English Colonies

Objectives

The student will make a map of the Thirteen Colonies showing the French, Spanish, and English territories before the French and Indian War. The student will locate the Thirteen Colonies given an outline map.

Procedure

1. Using clear overhead projector paper, have students trace outline map of the United States as below.

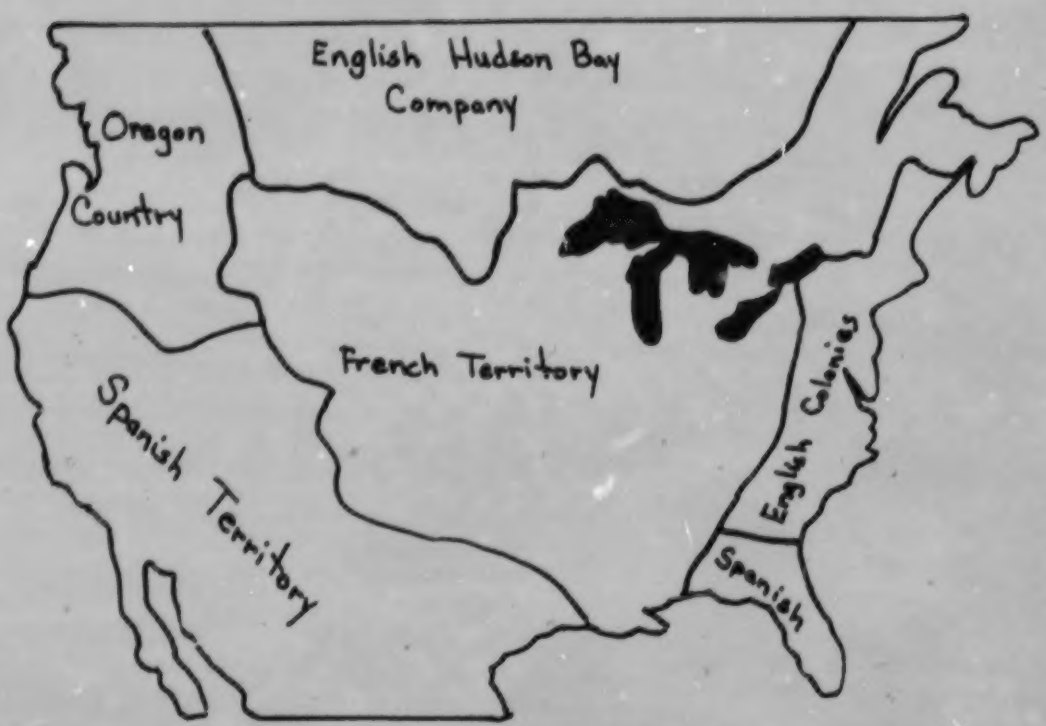
2. Make another copy of map filling in each area using the following colors (overhead projector paper, construction paper, or oaktag may be used):

French Territory -- Yellow

Spanish Territory -- Red

English Territory -- Blue

Outline Map


English Hudson Bay Company
Oregon Country
French Territory
Spanish Territory
English Colonies
Spanish

3. Carefully cut colored map (Activity #2) apart to separate the French, Spanish, and English territories.

4. The student will reassemble cutout map parts over the outline map (Activity #1).

Evaluation

The student will locate the cutout map parts of the French, Spanish, and English territories over his outline map (Activity #1) from memory.

Lesson B. Location of English Territory After the French and Indian War

Objectives

The student will make a map showing English territory after the French and Indian War. The student will locate the Thirteen Colonies on this map.

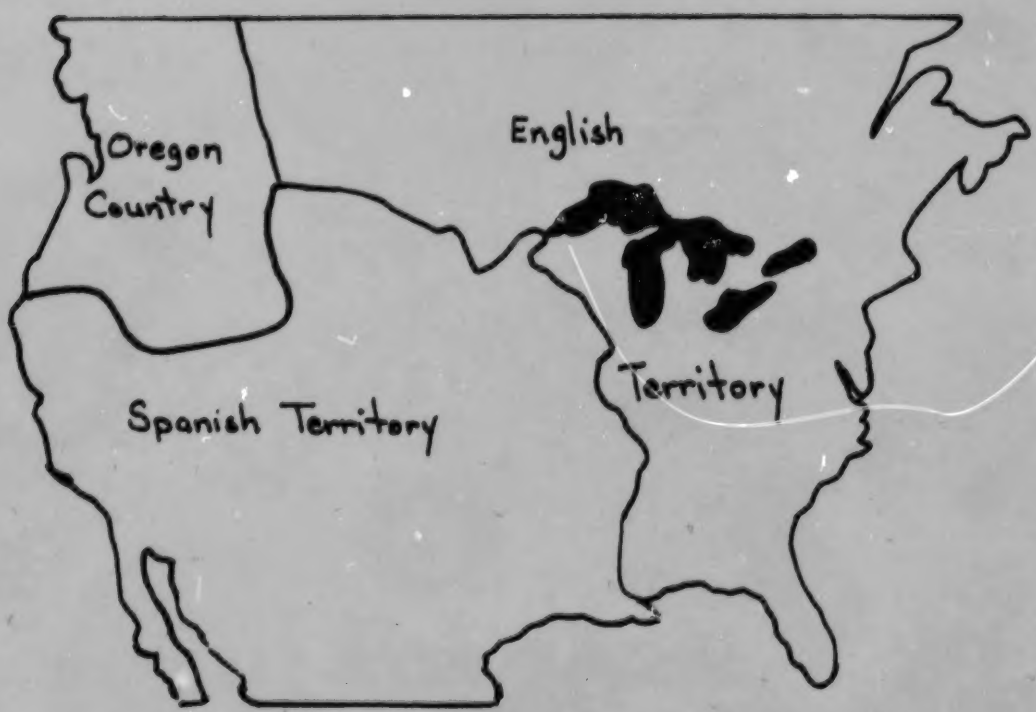
Procedure

1. Using clear overhead projector paper, trace the map below.
2. Use same colors as in Activity #2, Lesson A.
3. Carefully cut colored territories apart.
4. Compare with territories shown in Activity #2, Lesson A.

Evaluation

Using the outline map from Lesson A, Activity #1, the student will locate the Thirteen Colonies on the map showing English territory after the French and Indian War.

Territory After War



Lesson C. Roots of Colonial Empires in America

Objectives

The student will compare motivations of French, Spanish and English colonizations.

Procedure

1. View filmstrip "French Settlements in the New World" and discuss motivation for French colonization.

   A. What were the main reasons the French colonized the New World?

      Answer: For hunting and fishing grounds.

2. View filmstrip "Spain in the New World" and discuss motivation of Spanish colonization.

   A. What were the main reasons the Spanish came to the New World?

      Answer: Conquest and plundering treasure in Mexico and South America.

   B. Were the reasons the French and Spanish came to the "New World" similar or different?

      Answer: Both wanted to take resources. Neither wanted to settle.

3. View filmstrip "England in the New World" and discuss motives of the English settlements.

   A. What were the main reasons that the English came to the New World?

Answer: Religious persecution, domineering government, poverty, oppression, escape from debtors' prisons.

B. How were the motives of the French and the Spanish different from the motives of the English?

Answer: The French and Spanish came for financial gain and wealth. The English came to establish homes and a good life.

Evaluation

The student will match the motives with the country pursuing them -- either orally or written.

Mark F for French.

Mark S for Spanish.

Mark E for English.

1. _____Looters in Mexico and South America.
2. _____Trappers and hunters in the North.
3. _____Fishermen in the North central part.
4. _____Freedom to worship.
5. _____Builders of homes along the Atlantic Ocean.
6. _____Treasure hunters.

Answer Key:

1. S
2. F
3. F
4. E
5. E
6. F and/or S

Lesson D. British Influence and Colonial Dependence

Objectives

From an oral or written list, the student will identify ways in which the colonists were dependent upon the British.

Procedure

1. Discuss the meaning of "dependence."
   A. We are dependent upon our parents for many things. We depend upon parents to provide us with food. Name some other things for which we are dependent upon our parents.
      Answer: clothing, housing, schooling, recreation, money, TV, transportation, etc.
2. Relate the above to the situation of the colonists.
   A. The colonists were dependent upon the British to provide many of the same kinds of things.
3. Discuss colonial dependence.
   A. In what ways were the colonists dependent upon the British?
      Answer: For all things they could not produce themselves.

Evaluation

The student will identify at least five items below for which the colonists depended upon the British.

protection from Indians
tobacco
tools
cattle
furniture
candles
food
clothing
ships
glass
spices
trade
horseshoes
rope

Lesson E. Making a Field Trip Log

Objectives

The student will make a Field Trip Log suitable for use on all field trips.

Procedure

1. Materials needed for each student:

   1 Manila file folder (or 18" x 24" oaktag folded in half lengthwise to form 12" x 18" folder)

   1 paper fastener

   18" yarn or string

   1 pencil with eraser

2. Tie one end of the string or yarn securely around the eraser end of the pencil by wrapping the string around several times and knotting tightly.

3. Secure the other end of the string to the paper fastener just below the head of paper fastener.

4. Open the file folder.

5. Make a mark that is two inches from the top and one-half inch from the centerfold.

6. Push the paper fastener through the file folder at the point and secure it to the file folder.

7. Close the file folder.

8. Have the student put his/her name on the front and decorate as desired.

9. For each field trip, make appropriate Field Trip Log work sheets and staple or use paper fasteners to attach them to the inside right-hand page of the file.

10. For each subsequent field trip, the Field Trip Log work sheets are added to the top of the pile. The work sheets can be stored in this folder.

11. The student takes his/her Field Trip Folder on each trip.

12. A sample work sheet follows. Use the items as desired.

13. Items #1-12 have been written to be useful on all field trips. These items should be arranged separately on the ditto sheets so the teacher can reuse the ditto sheets for each trip.

14. Items #13-18 may be varied for future trips.

15. Items #19-21 can be included on all field trips.

SAMPLE FIELD TRIP LOG

1. Name_____

   Date_____

   Destination_____

   _____

2. Show the time of leaving school here:_____

   It was_____miles to our destination.

3. The weather is_____and_____.

4. The direction we traveled was _____.

5. Put an X if you see it:

_____Airport

_____Shopping center

_____Cemetery

_____Gas station

_____Inspection station

_____Pine trees

_____Lake

_____Park

_____Clock

_____Temperature

_____Radio station

_____10-story building

_____Bank

_____Sports store

_____Beauty parlor

_____Farm

_____Weather vane

____ Stream or river

_____Golf course

_____Train station

_____House with more than two chimneys

(Add or delete items according to personal preference).

6. Check the kinds of transportation that you see:

_____Car	_____Airplane	_____Motorcycle
_____Pickup Truck	_____Walking	_____Boat
_____School Bus	_____Bicycle	_____Tractor Trailer
_____Passenger Bus	_____Horseback	_____Freight Train
_____Van	_____Other	_____Passenger Train

(Add or delete items as desired).

7. Draw one State and one Interstate Route sign.

8. Show the time of arrival at destination_____.

9. The trip took_____hours,_____minutes.

10. It was _____miles to our destination. (Ask bus driver).

11. When we return to school, we will figure out how many miles per hour the bus traveled. Write the answer here_____.

12. On the back of this page, sketch at least five interesting things that you saw. Put the name of each, if you can.

13. The thing that I liked best about the (museum) was

_____

_____.

14. The thing that made me think that I would like to live in colonial days was _____

_____

_____

_____.

15. The thing that made me sure I would not have liked living in colonial times was _____

_____

_____.

16. I think that the hardest thing to do during colonial times was _____

_____.

17. I think that the easiest thing to do during colonial days was _____

_____.

18. The things that I would like to learn more about are_____

_____

and_____.

19. The thing that I would like to use is_____

_____

because_____.

20. The best part of the field trip was_____

_____.

21. The worst part of the field trip was_____

_____.

Lesson F. Visiting a Colonial Museum

Objectives

The student will take a field trip to a colonial museum to compare colonial living conditions to those of modern time. The student will illustrate the most interesting or unusual colonial artifacts which s/he saw.

Procedure

1. Contact a colonial museum such as the Clinton Historic Museum, Clinton, New Jersey.

2. Schedule a field trip to the museum.

3. Ask the person you contact at the museum to send you a brochure and any pertinent information which will be helpful in preparing the students for the field trip.

4. If possible, visit the museum prior to field trip to get a better idea of what the students will see.

5. Have each student prepare a Field Trip Log as outlined in Chapter II, Lesson E.

6. Prepare the students for the field trip with a discussion of the kinds of things they can expect to see.

7. During the field trip, encourage the class to ask about the use and history of the items they have never seen before. The tour guide will be most helpful and knowledgeable in this regard and can be a valuable resource.

8. Following the field trip, discuss what has been seen. Discuss the Field Trip Logs also.

9. Store the Field Trip Log folders for future use.

Evaluation

The Field Trip Log serves as the evaluation for this lesson.

Lesson G. General Living Conditions -- Occupations After Visiting a Colonial Village

Objectives

The student will describe an occupation or colonial craft.

Procedure

1. Contact a colonial village such as Liberty Village, Flemington, New Jersey.

2. Schedule a field trip to the village.

3. Ask the person you contact to send you a brochure and any pertinent information which will be helpful in preapring the student for the field trip.

4. If possible, visit the museum prior to the field trip.

5. Have each student prepare a Field Trip Log as outlined in Chapter II, Lesson E (omit this step if previously done).

6. Add work sheets to the Field Trip Log that are appropriate for this trip.

7. Prepare the students for the field trip with a discussion of the kinds of things they can expect to see.

8. Encourage the students to ask questions.

9. Following the field trip, discuss it and the Field Trip Logs.

10. Store the Field Trip Log folders for future use.

Evaluation

The student will describe one of the colonial crafts listed below:

blacksmithing

cabinet making

candle making

dyeing

glassblowing

riflemaking

silvermaking

soap making

spinning

weaving

(Items may be added or deleted as desired).

The student may include:

a. why the craft was needed

b. The raw materials required

c. the kinds of tools required

d. ways in which the craft was learned

e. number of steps

f. length of time required

Lesson H. Colonial Museum

Objectives

The student will collect, classify, and label articles for a colonial museum, in the classroom.

Procedure

1. Discuss the kinds of things observed during the field trip to the colonial museum.

2. Discuss the reasons for various items no longer being used.

   A. People need clothing as they did in colonial days. How did they get their clothing?

      Answer: People made the clothes.

   B. How did they make clothes?

      Answer: They made the material on a loom and sewed the clothes.

   C. Where did people get the thread to use on the loom to make the material?

      Answer: They used a spinning wheel to spin the thread.

   D. Did the spinning wheel and the loom work for colonial people? Did it do the job?

      Answer: Yes.

   E. If your mother used a spinning wheel and a loom to make clothes for everyone in your family, how much time would it take?

      Answer: A very long time.

F. Would the fact that the spinning and weaving took a long time be a reason for someone to invent a faster method?

Answer: Yes.

G. How are clothes made today?

Answer: By machines. In a factory.

H. Why are spinning wheels and looms no longer in use?

Answer: Clothes are made faster in a factory by machines.

I. Did factories or machines take over the work of any other colonial articles that you saw at the museum?

Answer: Yes.

J. Can you name things that were made by colonists that are now made in factories by machines? (make a list of all answers).

K. Looking at the long list, could you make a statement about the importance of factories and machines today?

Answer: Machines make almost everything people use.

L. The growth of factories and machines is one reason we no longer use some of the things that the colonists used. Can anyone think of another reason?

M. Another reason that we do not use many things that the colonists used is because people no longer use or need the particular articles. An example is the little cup, called a shaving mug, that held the soap to make lather with which to shave.

N. What does your dad use instead of a shaving mug:

Answer: Electric razor or shaving cream in a can.

O. To clean rugs, they were hung up and beaten with a metal rug beater. It looked like a large metal fly swatter. Why don't we use rug beaters any more?

Answer: Rugs are cleaned differently. By a vacuum cleaner, carpet sweeper or chemicals.

P. Can you think of any of the colonial articles that you saw at the museum that are not being made by machine because they are no longer used at all? (make a list of all answers).

Q. Another reason that some things are no longer used is because styles and peoples' tastes change.

3. Ask the students to bring any articles which could be used to create a classroom colonial museum.

4. Accept articles even if they were in use later than the 1700s.

5. Label each article with its name and use.

6. Contact local antique dealers to see if one would bring some unusual antiques and explain their uses, origin, etc., to the class.

7. Classify the old things which the students bring to the classroom museum.

8. Examples: They can be put into categories such as:

a. things used to make food

b. things used to make clothing

c. things used for health

d. things used by tradesmen

or

a. things used at home

b. things used on the farm

c. tools

d. things used around animals

e. things used in school

or

a. food

b. clothing

c. tools

d. shelter

9. Your categories will depend on the kinds of things that the students bring to school.

10. Display the items in a place that can be locked or otherwise secured, as many of these things will be valuable and some will be irreplaceable.

11. In the event the above precautions cannot be met, it would be advisable to have the item brought to school, photographed by Polaroid or Instamatic camera, and returned to the student the same day.

12. The photographs will then be on display in the classroom museum.

Evaluation

The classroom museum (the actual article or its photograph) serves as the evaluation of this lesson.

Lesson I. A Funny Thing Happened on the Way to the Bicentennial ...

Objectives

The students will assemble an illustrated book of interesting and unusual colonial customs and ideas.

Procedure

1. Materials needed:

   18" x 24" white drawing paper

   heavy thread

   large needle

   tracing paper

   carbon paper

   ruler

   soap eraser or other soft eraser

   2" binding tape

2. Begin by researching colonial customs and ideas that are unusual and interesting to the student, such as:

   A. Forks were not in common use

   B. The entire family ate directly from the cooking pot with their fingers

   C. Tomatoes were thought to be poisonous and were not eaten (a crowd assembled to watch a New Jersey man eat a tomato).

D. False teeth were made of wood

E. Many men had their heads shaved and wore wigs

F. Often, there was only one chair in the house and no one dared sit in it except the father

G. Making sick people bleed was thought to make them well

H. Beer was consumed by young and old and often at breakfast

I. Passenger pigeons (now extinct) were so plentiful thet clouds of them darkened the sky; they were sold in market for a penny a piece

J. In church, people kept their feet warm during long sermons by putting them on dogs

K. Children were given imaginative names including, Ahab, Zerubbabel, Gift-of-God, Kill-Sin, Joy-from-Above, Increase

L. If there were no medieval doctors nearby, the barber performed the duties of a doctor

M. Sledding was said to be a waste of time

N. Swimming was said to be a waste of time

O. It is said that the first man to sit in the Boston stocks was the carpenter who built them -- he had stolen the money to buy the wood to make the stocks

P. Some fireplace logs were so large it took two horses to drag them into the house

Q. People laughed and threw rotten apples and mud at people who had to sit in the stocks

R. Every man had to shoot three crows or twelve blackbirds between March and June, according to a law in one town

S. It was against the law to kiss either of your parents on Sunday

T. Walking around at night was against the law

U. One medicine was a tea made of ground-up roasted toads

V. Some wigs were made of wire

3. Use the tracing paper to trace appropriate illustrations for each interesting or unusual custom or idea. The pictures can also be drawn freehand or copied, if desired

4. Each 18: x 24" piece of white drawing paper will constitute four pages of the book.

5. Cut as many sheets of 18" x 24" as needed so that they measure 17" x 22-1/2".

6. Fold each sheet in half to measure 17" x 11-1/4".

7. If you have traced your illustrations, transfer them to one side of the folded drawing paper as follows:

A. Lightly mark the area where the illustration is desired -- it can be placed at the top, in the middle, or at the bottom of the page.

B. Place carbon paper in this area, black side down.

C. Place the traced illustration on top of the carbon paper

D. Using a sharp pencil, draw over the traced illustration, being careful not to move the illustration

E. Remove the tracing paper and carbon paper

F. Go over the resulting illustration with strong black lines, using a fine felt-tipped marker

G. The illustrations can now be colored in with felt-tipped markers, or left as is

H. Using a ruler, lightly draw lines 1/2" to 1" apart, on which to write a description of the custom illustrated

I. Carefully print the description, which should be brief, lightly with pencil

J. Go over the pencil carefully with a fine black felt-tipped marker

K. Let dry thoroughly

L. Lightly erase all pencil marks, using a soap eraser or other soft eraser

M. Continue to make drawings and stories on all four sides of each folded paper

N. Do not number pages yet, as the book will be bound at the middle and the two sides of the folded paper will not face each other when the book is assembled

8. Use two sheets of folded paper also 17" x 11-1/2", one inside the other, to make the title pages, etc., as follows:

A. On the first or top page print the title page using the same method as outlined above in H, I, J, K, AND L

B. This page should include book title, all authors; all illustrators

C. With one folded sheet inside of the other, turn the title page and use the other side of it as the second page

D. The second page should contain the copyright date, and city and state where published

E. Follow same method H to L on all of the remaining folded pages

F. Page 3 will be the top sheet of the second folded paper which is inside the first folded paper

G. Page 3 will contain the dedication and can be determined by the group

H. Dedication possibilities are:
For the Celebration of the Bicentennial
For the Tireless Colonists
For the Interesting Colonists
For Progress

I. Page 4 will remain blank

J. Pages 5, 6, 7 and 8 will be at the end of the book when it is completed

K. Page 5 will remain blank

L. Pages 6 and 7 may be used for bibliography and index, if desired, or left blank also

M. Page 8 will be blank

9. To make a book cover:

A. Lay three or four pieces of 18" x 24" white drawing paper on top of one another (note larger size -- do not cut as for pages)

B. Put tape around all four edges of paper so that 1" of tape is on each side of sheet and pages are taped together

C. Fold in half to measure 18" x 12"

D. Put title and illustration (if desired) on front cover using transfer and finishing methods outlined above

10. To assemble book:

A. Open book cover

B. Open the two title pages sheets (Activity #8) and lay on top of book cover

C. Open each illustrated story page and lay on top of one another over title page

D. Match the fold on all pages

E. Center the book pages so that book cover extends evenly on all four sides

F. Use large paper clips and/or rubber bands to keep the pages from moving during the binding

G. Thread the needle to form double strand and knot

H. Begin sewing by inserting needle into fold of middle page about 3/4" - 1" from the bottom of the book

I. Pull thread through to knot

J. Insert needle through book cover at fold about 3/4" above first stitch

K. Pull thread through

L. Continue sewing binding in this manner until you reach the top of the fold

M. End the thread on the inside of the book and knot

11. Number the pages, if desired

Evaluation

The finished book is the evaluation.

Lesson J. Field Trip to Historic Village

Objectives

The student will visit an historic village.

Procedure

1. Contact Fallington, Pennsylvania, a small authentic early American village (the town is just off Route 1, three miles south of Trenton, New Jersey). Check visiting hours. Meetinghouse Square is at the center of the village and is surrounded by more than twenty houses built in the 1700s. Most of these houses are still occupied by descendents of the original builders. The village was settled by friends of William Penn. "Pennsbury," the home of William Penn is four miles away along the Delaware River.

2. Schedule a field trip to the village.

3. Ask the contact person at the village to send you a brochure and any pertinent information which will be helpful in preparing the students for the field trip.

4. If possible, visit the village prior to the field trip to get a better idea of what the students will see.

5. Have each student prepare a Field Trip Log as outlined in Chapter II, Lesson E.

6. Prepare the students for the field trip with a discussion of the kinds of things they can expect to see.

7. During the field trip, encourage the class to ask about the use and history of the items they have never seen before. The tour guide will be most helpful and knowledgeable in this regard and can be a valuable resource.

8. Following the field trip, discuss what has been seen. Discuss the Field Trip Logs also.

9. Store the Field Trip Log folders for future use.

Evaluation

The Field Trip Log serves as the evaluation for this lesson.

CHAPTER III

THE HISTORICAL YEARS -- 1770-1782

This chapter presents the major events of the pre-Revolutionary and Revolutionary War period. Skits, role-playing, construction of shadow boxes and bulletin boards, poetry writing, a field trip, and other methods have been selected for their high interest to, and adaptability for, the disadvantaged student.

Lesson A. Events Leading to the Declaration of Independence

Objectives

The student will construct a time line of important events which occurred before the Declaration of Independence.

Procedure

1. Research some or all of the events listed below to establish when, where, what, who, why for each:

   a. Proclamation Line - 1763

   * b. Stamp Act - February, 1765

   * c. Quartering Act - 1765

   d. Virginia Resolutions - May, 1965

   e. Stamp Act Congress - October, 1765

   * f. Sons of Liberty - 1765

   g. Repeal of Stamp Act - March, 1766

h. Townshend Acts - 1767

* i. Boston Massacre - March 5, 1770

j. Repeal of Townshend Acts - March 5, 1770

* k. Organization of Committees of Correspondence - 1772

* l. Tea Act - 1772

* m. Boston Tea Party - December, 1773

* n. First Continental Congress - September, 1774

* o. Midnight Ride of Paul Revere - April, 1775

* p. Lexington and Concord - April, 1775

* q. Seizure of Fort Ticonderoga - May, 1775

* r. Second Continental Congress - May, 1775

* s. Washington chosen to command colonial troops - June, 1775

t. Continental army established - June, 1775

u. Olive Branch Petition - June, 1775

* v. Battle of Bunker Hill - June, 1775

w. Creation of the Navy - October, 1775

x. Washington takes Boston - March, 1776

* y. Declaration of Independence - July 4, 1776

(The most significant events are starred).

2. To make a time line, use a continuous piece of paper fourteen feet long. Fourteen, 12" pieces of paper can be used also.

3. The width of the paper can vary from 3" to 24" or more according to the paper available.

4. With a ruler draw two lines 1" - 2" apart through the length of the paper, as illustrated below.

5. Use a ruler to form one inch boxes between the lines drawn for #5, as shown.

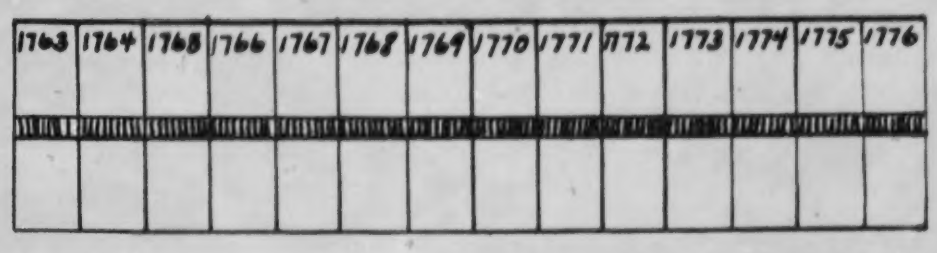
6. Make lines 12" apart across the paper widthwise to separate years, see illustration.

7. Label the years.

8. Write the abbreviation of each month in the 1" boxes.

9. Write the names of the events above and below the appropriate month and year.

10. The use of red, white and blue paper and markings is suggested.



Evaluation

Completion time is the evaluation for this lesson.

Lesson B. Committees of Correspondence

Objectives

The student will recreate the role of the Committees of Correspondence.

Procedure

1. Discuss modern methods of communication: radio, TV, mail, newspaper, satellite TV, telephone, telegraph, books, word of mouth.

2. Discuss the fact that none of these were available to the colonists except the newspaper and word of mouth.

3. Emphasize that the colonial newspaper was much smaller and much less readily available.

4. People read the newspaper (those that could read) and passed the newspaper on to someone else to read. The newspaper was not thrown away. News was often months old before many heard or read about it.

5. Review the research done on the Committees of Correspondence for Chapter III, Lesson A.

6. Let each student, or each group of students, choose one event from Chapter III, Lesson A about which to write.

7. Compile some or all news stories on one large piece of paper.

8. Discuss how colonists would have felt upon reading news of the various events.

Evaluation

The finished news stories serve as the evaluation.

Lesson C. Boston Tea Party

Objectives

The student will describe the Boston Tea Party in poetry and draw illustrations.

Procedure

1. View and discuss the film, "The Boston Tea Party."
2. Encourage the students to write non-rhyming narrative poems.
3. The students can write their poems from various points of view. For example, the Boston Tea Party as seen by:
   a. the ship's captain
   b. a patriot
   c. a young boy or girl as he or she watches
   d. the English Governor
   e. one of the "Indians"
   f. a patriot's wife or mother
   g. a colonist in another colony
   h. King George
   i. a "Redcoat"

   (This may be done on a group basis or on an individual basis).
4. Illustrate
5. Display on bulletin board, etc.

Evaluation

The finished product is the evaluation.

Lesson D. The Midnight Ride of Paul Revere; Lexington and Concord

Objectives

The student will present a skit comparing and contrasting the colonists view and the English view and the English view of the Midnight Ride of Paul Revere and the battles at Lexington and Concord.

Procedure

1. Review the material gathered in Chapter III, Lesson A about Paul Revere's ride and the events at Lexington and Concord.

2. View and discuss the film, "The Shot Heard Round the World."

3. Read aloud to the students and discuss, "The Midnight Ride of Paul Revere" by Ralph Waldo Emerson.

4. Designate some, or half, of the students to take the colonists' point of view.

5. Let the remainder, or some of the students, take the British point of view.

6. Let the "colonists" choose various characters to portray, such as:

   a. a minuteman who was awakened by Paul Revere
   b. a farmer who helped move the ammunition before the English arrived
   c. a young boy or girl who had to stay at home

d. a tavern keeper

e. a patriot

f. a mother whose son or husband has gone to Concord and not returned

g. a man who thinks he may have been the one to shoot first

7. Let the "colonists" make small signs which state the character each portrays.

8. Pin the sign on the front of each student or hang around the neck from a string.

9. Follow the same procedure with the English using characters such as:

a. a Redcoat who was fired upon all the way back to Boston

b. a Redcoat who is waiting to be transferred to England

c. a colonist who is loyal to the English King (a loyalist)

d. the English governor of Boston

e. a wife of one of the English commanders who has not returned

f. a merchant who is returning to England

g. a soldier who thinks he may have fired the first shot

10. Conduct a group discussion determining how each of the characters may have felt and how they would react to the events taking place.

11. Sitting in a circle, let one character begin role playing by making a comment appropriate to his character or role.

12. Elicit comments from all characters, in any order or sequence, asking such questions as: How would you feel about the events? What would you say about them?

13. After a short time, switch roles and continue playing with new characters.

Lesson E. The First and Second Continental Congress

Objectives

The student will compare the First Continental Congress with the Second Continental Congress.

Procedure

1. Conduct research or review research done on the First Continental Congress and the Second Continental Congress in Chapter III, Lesson A.

2. Determine categories for comparison of the First Continental Congress to the Second Continental Congress.

3. Make and complete a large chart suitable for a bulletin board, such as:

	First Continental Congress	Second Continental Congress
Date begun		
Date ended		
Number of delegates		
Colonies represented		
Colonies not represented		
Major debates		
Major decisions		

Lesson F. The Declaration of Independence

Objectives

The student will recite part of the Declaration of Independence. The student will classify the signers of the Declaration of Independence according to age, occupation, and colony represented.

Procedure

1. Read aloud the entire Declaration of Independence.

2. Discuss the meaning of each phrase and rephrase each as simply as possible.

3. The student will memorize the first few lines of the Declaration of Independence, ending with "as to them shall seem most likely to effect their safety and Happiness" or at some other place, according to the ability of the student.

4. Research all or some of the fifty-six men who signed the Declaration of Independence. This can be done on an individual basis or group basis.

5. List the age, occupation, and colony of each.

6. Make a large chart suitable for a bulletin board as shown below:

Signers of the Declaration of Independence			
Name	Age	Occupation	Colony

7. At the bottom of the chart, add the following information:

Number of signers_____

Average age of signers_____

Most common occupations of signers

_____ _____

Colony with largest number of signers

_____

Colony with fewest number of signers

_____

First signer_____

Last signer_____

Youngest signer and age_____

Oldest signer and age_____

Evaluation

Conduct a choral speaking of the lines of the Declaration of Independence which have been memorized. The chart also serves as an evaluation.

Lesson G. The Revolutionary War

Objectives

The student will construct shadow boxes depicting events of the Revolutionary War, after visiting Washington's Crossing and Valley Forge.

Procedure

1. View and discuss some or all of the films and filmstrips related to the Revolutionary War which are included in the Teachers' References.

2. Plan a field trip to Washington's Crossing, New Jersey, and Valley Forge, Pennsylvania.

3. Ask the person you contact to send any pertinent information to you which might be helpful in preparing the students for the field trip.

4. If possible, visit the site prior to the field trip.

5. If not previously completed, have each student prepare a Field Trip Log as outlined in Chapter II, Lesson E.

6. Ditto student work sheets of items #1-12, Chapter II, Lesson E.

7. Add items to the work sheet ditto that pertain to Washington's Crossing such as: date of crossing; number of boats making crossing; number of men; kinds of boats; number of cannons crossed; number of horses crossed; number of hours crossing took; name of river; states bordering river; and so on.

8. Add items to the work sheet ditto that pertain to Valley Forge such as: date encamped there; number of men encamped there; source of food supply; source of ammunition supply; number of buildings; number of men per building; miles from Washington's Crossing; source of heat; general living conditions; and so on.

9. Prepare the students for the field trip with a discussion of the kinds of things they can expect to see, using the log work sheets.

10. During the trip, encourage the students to ask questions. The guides generally have a wealth of unusual and interesting information and are only too happy to share it with interested visitors.

11. The field trip follow-up should include mathematical computation to determine miles per hour (Log Items #9, 10, 11); a general discussion of the things learned during the field trip; and a discussion and evaluation of the work sheets in the Field Trip Log.

12. Store the Field Trip Logs for future use.

13. To make a shadow box:

A. Decide on the event you wish to depict

B. Select any size box; shoe boxes work well but larger cardboard boxes work well also.

C. With the lid removed, lay the box on its side; the opening will be the front

D. Paint, crayon or use magic marker to color the back of the box to look like distant background; example, blue sky, clouds.

E. Use construction paper to make trees, woods, mountains, buildings, etc., in the immediate background.

F. Glue these to back and insides of box

G. Many natural materials can be used, such as twigs for trees; pebbles to form stone walls; dirt for roads or hillsides; moss for grass; pieces of straw for corn bundles; red berries for apples; twigs for log cabins, etc.

H. Small toys of plastic or metal can also be used such as horses, wagons, soldiers, dolls, Lincoln logs, railroad train accessories, rifles, fences, etc.

I. Use white glue generously throughout

J. When dry, put a label on the shadow box which names the event depicted

K. Clear cellophane paper may be taped over the opening if desired.

Lesson H. Important People

Objectives

The student will play the role of important colonists who meet at the King's Arms Tavern.

Procedure

1. Let each student choose one person from the list at the end of the lesson.

2. The student should discover as much information as possible about his/her "colonist."

3. Age, attitudes, important speeches or writing, clothing and hair style, occupation, family status, and where he lived are some of the kinds of information needed.

4. The colonial pubs or taverns were meeting places used for the exchange of views, news, and ideas. The usual colonist, unless travelling, would be in his working attire.

5. Let each "colonist" decide on appropriate costuming to portray his/her famous person such as: white stockings; paper buckle on shoes; lacy blouse; pants tied at knee for knickers; vest; wig; three-cornered hat; old-fashioned glasses; rifle; appropriate tools; etc.

6. Set chairs around several tables.

7. Designate spot to be the fireplace.

8. Coffee cups can serve as "mugs."

9. Imitation pipes can be used.

10. The role-playing can begin with two arrivals at the pub, who talk of their work, and the events taking place in the colonies.

11. As each new arrival appears, more conversation is generated.

12. Remind the student to put himself in the colonists place in order to comment about his work and ideas.

List of Important People:

Benjamin Franklin

John Adams

Samuel Adams

Ethan Allen and the Green Mountain Boys

Benedict Arnold

David Bushnell

George Rogers Clark

William Dawes

John Dickinson

Nathan Hale

John Hancock

Patrick Henry

John Jay

Thomas Jefferson

John Paul Jones

Henry Laurens

Richard Henry Lee

Thomas Paine

CHAPTER IV

EVENTS RELATING TO THE BICENTENNIAL CELEBRATION

This chapter suggests a commemorative collection of newspaper articles pertinent to the American Bicentennial.

Lesson A. Assembling a Bicentennial Scrapbook

Objectives

The class will assemble a scrapbook of articles pertaining to events taking place or being planned to commemorate the American Bicentennial.

The class will present the scrapbook to the town governing body or bicentennial committee for preservation.

Procedure

1. Write to elementary schools in as many towns as possible in the states which were original thirteen colonies.

2. Address to same grade level or "Bicentennial Committee."

3. Explain that your class is interested in newspaper accounts of Bicentennial events and events planned.

4. Ask if they would be interested in collecting them from their area newspaper and sending them to you; or, sending name and address of group or individual who might be interested.

5. Beside school and local bicentennial committees, nursing homes, sanatoriums, and government hospitals are other places to write to for collection of newspaper articles.

6. Construct a scrapbook following procedure outlined in Chapter II, Lesson I, A Funny Thing Happened on the Way to the Bicentennial.

7. Glue, laminate, or tape articles in scrapbook: a) random order; b) by states; c) in chronological order; or d) whatever order seems appropriate.

8. Label each as to date, newspaper, city and state.

9. Contact the local bicentennial committee and present the scrapbook to them. Perhaps a representative of the group could come to class for the presentation. Arrange to have a polaroid photograph taken of the presentation. Place the photograph in the scrapbook.

10. If there is no local bicentennial committee, see if arrangements could be made to preserve the scrapbook with school records.

CHAPTER V

COLONIAL OCCUPATIONS -- FOODS AND RELATED NEEDS

The lessons in Chapter V are all "hands-on" experiences and are particularly valuable to the disadvantaged student. Some or all of the lessons may be used as there is no sequential order or cumulative effect. The evaluation of each lesson is the finished product.

The concept that the world of work during colonial days was concerned largely with survival is inherent in this chapter.

Lesson A. Making Bread

Objectives

The students will make bread.

Procedure

For one loaf of bread, follow this recipe:

1 package or 1 TB. yeast
1/2 cup warm water
1/2 cup milk
1 stick of butter or margarine
1 cup sugar
1 teaspoon salt
3 eggs
3-1/2 to 4 cups flour

Dissolve yeast and sugar in the water in a mixing bowl. Let the mixture stand five minutes. Melt the butter in the milk. Add butter, milk, and salt to the yeast mixture. Add eggs and flour to make a stiff batter. Cover the bowl and let stand until double in bulk. Punch down. Put into a buttered pan and let rise until double in bulk. Bake in 375-degree over for 45-50 minutes. Cool on rack.

Evaluation

Enjoy eating the bread.

Lesson B. Making Butter

Objectives

The students will make butter.

Procedure

1. Use a large clean jar with a tight-fitting screw-on lid, or a glass butter churn with paddles.

2. Use about 1-1/2 to 2 cups of heavy cream which is at room temperature.

3. Put the heavy cream in the jar, screw lid on tightly and begin to shake the jar.

4. In a short time (15 to 25 minutes) butter will begin to form. Continue to shake the jar until a solid yellowish ball is formed. There will also be a small amount of whitish liquid (whey).

5. Pour off the whey.

6. Washing the butter. Put the butter in a bowl. Pour about one cup very cold water over the butter. With the back of a spoon, mix the water through the butter. As the whitish liquid (whey) is released from the butter, the water will become cloudy. Pour off the water. Add more and repeat the process several more times until the water stays clear.

7. Mix a pinch of salt into the butter.

8. Pack in butter molds, if available.

Evaluation

Spread the butter on the homemade bread or crackers and enjoy.

Lesson C. Making Ice Cream

Objectives

The students will make ice cream.

Procedure

These recipes make four quarts of ice cream and will serve 12 to 16 people. Two quarts may be made satisfactorily by reducing the recipes by one-half. For six quarts, increase recipe by one-half. Best results are attained by making at least half a freezer full, but it is possible to make as little as one quart.

Before Making Ice Cream:

1. Clean ice cream can, cover and dasher. Wash in hot soapy water and rinse thoroughly with hot water. Allow to cool before using.

2. Prepare ice cream mixture. Select any of the above recipes or your favorite mix. Chill mixture before pouring it into the cooled can.

3. Prepare ice. Use crushed or cracked ice. Ice cubes may be used, but first they should be put in a bag and crushed with a mallet. The finer the ice, the smoother the texture of the ice cream.

4. Insert dasher in can.

5. Pour chilled mixture into can.

6. Position can in freezer bucket.

7. Position Motor Drive (or Hand Crank) Unit.

8. Start motor

9. Packing salt and ice. Allow motor to run for approximately two minutes. Put a layer of ice 3 or 4 inches deep into bucket. Put in 1/2 cup rock salt. Repeat layers until full.

10. Check the drain hole periodically. It must be free from obstruction in order that the brine can drain properly. A plugged hole may allow brine to seep into the can and contaminate the ice cream. A lead pencil is suitable for this purpose.

11. Allow ice cream to churn about 20 to 30 minutes or until motor slows or stops, or when hand model becomes difficult to turn. Disconnect immediately when the motor stops. Ice cream will be doubled in bulk and will be the consistency of whipped cream.

12. Unplug motor. Clear away ice and salt to about one inch below the cover of the can. Remove motor drive unit. Wipe cover carefully before removing. Lift out dasher and scrap clean with rubber spatula.

13. Ice cream is delicious eaten at once; or the ice cream may be left in bucket to make the ice cream harder. Ice cream can also be put into the freezer.

Recipes for Making Ice Cream:

COUNTRY VANILLA ICE CREAM

No cooking.....Just add eggs to beat and milk to measure. Ice cream to bring back memories of Sunday afternoons long ago.

4 eggs
2-1/2 cups sugar
5 cups milk
4 cups heavy cream
4-1/2 teaspoons vanilla
1/2 teaspoon salt

Add sugar gradually to beaten eggs. Continue to beat until mixture is very stiff. Add remaining ingredients and mix thoroughly. Pour into freezer and freeze as directed.

MISSISSIPPI ICE CREAM

A rich vanilla ice cream that is very easy to make.

10 cups light cream
2 cups sugar
2 teaspoons vanilla
1/4 teaspoon salt

Pour cream into gallon freezer. Gradually add sugar, stirring constantly until sugar is dissolved. Stir in vanilla and salt. Freeze as directed.

ECONOMY ICE CREAM

Mix together: 2-2/3 cups (30 ounces) condensed milk
4 cups cream
2 cups milk
2 tablespoons vanilla

Pour into freezer and freeze as directed.

Lesson D. Making Beef Jerky

Objectives

The student will prepare beef jerky.

Procedure

1. In colonial days, jerky was air-dried over a period of two or three months.
2. Trim all fat from one pound top round of beef.
3. Cut into very thin strips.
4. Lay beef strips in crock or bowl, sprinkling each layer lightly with liquid barbeque smoke, salt, and pepper.
5. Cover with foil and place weights on top.
6. Refrigerate overnight.
7. Drain and dry strips of beef with paper toweling.
8. Place strips on racks in shallow pans in 150-degree oven to dry.
9. Bake from 4 to 11 hours until dry.

Lesson E. Preserving Vegetables

Objectives

The student will preserve peppers.

Procedure

1. Wash and dry fresh green bell peppers, sweet red peppers, or hot cherry peppers.
2. Cut off tops, remove seeds and white membrane.
3. Dice the peppers into 1/4" pieces.
4. Arrange pepper pieces on a single layer on a cookie sheet.
5. Put in a 150-degree oven, stirring once and hour, and cook 3 hours.
6. Let tray stand overnight before packing peppers into clean glass jars.
7. Directions to reconstitute: Soak 1/2 hour in ice water.
8. Onions may also be dried 2-1/2 hours at 150 degrees.
9. Celery leaves dry more quickly at 150 degrees also.

Lesson F. Making Maple Syrup

Objectives

Making Maple Syrup.

Procedure

Background information:

1. the recommended time to tap a maple tree is the first or second week of February.

2. The sap often runs most profusely in March.

3. Any of the varieties of maple trees are suitable for tapping.

4. The best sap results when the temperature is below freezing at night and well above freezing during the day.

5. The sap is usable for syrup until the tree buds out. The sap becomes "woody" tasting at this time.

6. It takes 32 - 40 parts sap to produce one part syrup.

7. Indoor evaporation of the sap is not recommended for large quantities, but will work for smaller amounts if exhaust fan is used.

8. Sap should be boiled down about every two days during warm weather. During freezing weather, a slightly longer period of time can elapse before processing.

9. Younger trees often have a higher yield of sap than older trees.

Equipment Required:

1. a drill with a 7/16 inch bit, power or manual.

2. A spile or spout, to put into each tap hole (can be ordered from SMADA Farms, Inc., Greene, New York 13778), or you can try the end of a metal funnel.

3. Plastic tubing to fit end of spile (take a spile with you to the hardware store for perfect fit).

4. A clean garbage can to collect the sap, or other metal or plastic bucket or container.

5. Large, heavy-duty, plastic bag to fit inside garbage can.

6. String to anchor plastic bag to outside of garbage can; to tie lid to handle; and to tie can to tree if in a windy, unprotected spot.

7. A large pan and heat source for boiling down the sap. The size of the pan will depend on the amount of sap involved. A roasting pan works well.

8. A candy thermometer with an easily read scale calibrated to at least 230 degrees.

9. Wool, orlon or other material for filtering the finished syrup while hot.

10. Containers for finished syrup.

Tapping the Trees:

1. Sanitize washed spiles, tubing and buckets by dipping in a solution of one part liquid bleach and nine parts of water.

2. Tap healthy trees which are 10 inches or more in diameter, as follows:

One tap - 10 to 15-inch diameter trees

Two taps - 16 to 20-inch diameter trees

Three taps - 21 to 25-inch diameter trees

No more than four taps for larger trees

3. Using 7/16 inch bit, drill holes 2" to 3" deep, straight in, 2 to 5 feet above the ground.

4. Locate new holes 6 inches to one side and 4 inches above or below old tap holes.

5. Tap spout securely in hole.

6. Push plastic tubing onto spout.

7. Tubing should be long enough to reach garbage can or other container, which has been lined with plastic bag.

Boiling the Sap:

1. Fill a large shallow pan with sap and heat to the boiling point, using a wood fire outdoors or a stove indoors.

2. Rapid boiling results in higher quality syrup.

3. As the level of sap is lowered through evaporation, add more sap.

4. When a reasonable amount of sap is left (about two times the amount you might expect, using the 32 to 1 ratio), the batch is "finished off."

5. "Finishing off" is best done indoors.

6. Pour small amounts of sap through filtering material, rinsing the material off as it collects debris, until all sap is filtered.

7. Return sap to heat source and bring to boil, using small pan with higher sides.

8. Using thermometer, continue boiling to seven and one-half degrees above the boiling point of water, (212^{o} + $7\text{-}1/2^{o}$ = $219\text{-}1/2^{o}$). Sap is now syrup.

9. Syrup may foam up during "finishing off."

10. Pour into clean containers.

11. Remove the spouts from trees.

12. Pack mud into holes.

Lesson G. Making a Pomander Ball

Objectives

The student will make a pomander ball.

Procedure

1. Materials needed:

   1 fruit for each student (choose orange, apple, lemon, lime, crabapple or osage orange)

   Pumpkin pie spice

   2 cans whole cloves per student

   12" square nylon netting

   12" pipe cleaner or ribbon

   Fork or nail

2. Select firm, ripe fruit.

3. Carefully pierce the fruit all over with the fork or nail, making holes no more than 1/4" apart.

4. Place pumpkin pie spice in a small bowl.

5. Roll the pierced fruit in the spice.

6. Press a whole clove into each hole so that the tops of the cloves are touching and the entire surface of the fruit is covered.

7. Place the finished fruit in the center of the 12" square of nylon net. A small piece may be used for the smaller fruits such as the lemon, lime or crabapple.

8. Gather the edges of the nylon net together tightly and secure by wrapping with a pipe cleaner or piece of ribbon.

9. Hang the pomander ball up using the pipe cleaner or ribbon, allowing air to circulate around it.

10. In about two weeks, the pomander will have shrunk and will be rock-hard. It is now ready to use.

11. Hang in linen, clothes, or storage closets. Use in bureau drawers. The spicy scent will last for years and will repel moths. The pomander will easily last for 20 years or more!

Lesson H. Potpourri

Objectives

The student will make a potpourri.

Procedure

1. Materials needed:

   large quantity of rose petals

   cinnamon, nutmeg, allspice, cloves

   powdered orris root (1 teaspoon to 1 cup petals, optional) (can be purchased at a drug store)

   small decorative jars with lids

   large covered jar for mixing

   paper towels

   tray

2. Gather petals from fully opened roses of any color.

3. To dry the roses, spread the petals in a single layer on a tray covered with paper towels.

4. In about four days, in clear weather, the petals should be dry and crisp. (They must be free of moisture or the mixture will become moldy). Put into large jar.

5. Mix a small amount of the spices in any proportion.

6. Sprinkle the spice mixture over the petals in the proportion of about two teaspoons of mixed spices to one cup of petals.

7. Sprinkle one teaspoon of powdered orris root over one cup of spiced petals. Orris root is a fixative and is recommended to keep the potpourri permanently fragrant. The potpourri can be made without it.

8. A small amount of dried orange peel may be added, if desired.

9. Stir the mixture thoroughly.

10. Store tightly covered in the large jar to enable the scents to blend.

11. After 5 to 7 days, put into small covered decorative jar.s

12. Remove lid each time a breath of summer is desired.

Lesson I. Making Soap

Objectives

The student will make soap.

Procedure

Materials needed:

3 quart jars of fat dripping or 2 quarts lard

1 pound can lye (handle with care)

1 quart cold water

3 teaspoons borax

1 teaspoon salt

2 teaspoons sugar

1/2 cup cold water

1/4 cup ammonia

(optional - 1/4 cup pine oil)

crock or earthenware vessel

wooden spoon

water

pot

bowl

9" x 13" glass pan

cloth to fit glass pan

knife

1. Use purchased lard or make lard from the fat drippings as follows:

   A. Put fat drippings in kettle.

   B. Add equal amount of water.

   C. Bring to a boil; stir.

   D. Put kettle in cold place to harden fat.

   E. Cut fat from the sides of the kettle.

   F. Pour off water and waste.

   G. Scrape off excess wastes from bottom of fat.

2. To make soap, heat the lard until melted. Let cool.

3. Put one quart cold water into a crock or earthenware vessel.

4. Carefully, add the lye to the crock.

5. Stir until lye is dissolved (mixture will become hot).

6. Let lye stand until cool.

7. Slowly add melted lard to the lye.

8. Stir constantly.

9. Mix remaining ingredients together.

10. Add to lye-lard mixture.

11. 1/4 cup pine oil may be added.

12. Stir until thick and honey-colored.

13. Pour mixture into glass pan, lined with a clean white cloth, to a depth of about 2 inches.

14. Before soap hardens, mark into pieces.

15. Let stand overnight or until hardened.

16. Cut into pieces.

CHAPTER VI

COLONIAL OCCUPATIONS -- CLOTHING

Chapter VI is designed to demonstrate the work of the colonial craftsmen dealing with fabric. The "hands-on" method, of particular value when working with disadvantaged students, is inherent in each lesson.

It is not necessary to use all of the lessons, although Lesson B, Making a Loom, and Lesson C, Weaving, have been written to use together in that order.

The finished product serves as an evaluation as well as a source of satisfaction to the student.

The opportunity to emphasize that satisfaction is an integral part of the craftsman's work, yesterday as well as today, exists in Chapter VI.

Lesson A. Dyeing Thread

Objectives

The student will dye thread using early American materials and methods.

Procedure

Materials needed:

thick cotton string

pot

wooden or metal stir (a tree branch would be fine; also a paint stir).

1. Cut thick cotton string (butcher's cord) into workable lengths of about 3 yards.

2. Tie the 3-yard piece of string into skeins about 6 inches long.

3. Experiment with various plant materials found growing outdoors as well as kitchen spices to produce appealing shades of dye. See list below.

4. Put small amount of plant material into a large amount of water.

5. Bring to a boil. Add material until desired shade is reached.

6. Immerse skeins of string into dye, allowing several skeins per student.

7. Continue to boil up to two hours, checking skeins until desired shade is reached. Varying the dyeing time will produce a variety of shades.

8. Remove skeins from dye and hang to dry.

9. Some materials and the colors produced are:

dry outer onion skins - bright mustard brown

coffee grinds - brown

tea leaves - brown

tumeric (spice) - bright yellow-orange

goldenrod flower - yellow

black walnut husks - rich brown

lily of the valley leaves - lime green

dandelion roots - magenta

grapes - purple

Lesson B. Getting Ready to Weave -- Making a Loom

Objectives

The students will construct a simple weaving loom.

Procedure

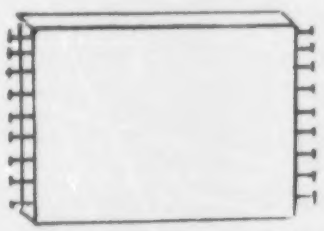
1. Assemble materials:

   8" x 10" x 1" piece of board (can be larger or smaller according to the size of completed weaving desired)

   28 - 32 - 1-1/2" nails with heads

2. Make a mark at 1/2" intervals across both 8" ends of board.

3. Hammer any even number of nails into one-inch surface of the board at each mark, as illustrated.



4. Nails should be firmly in the wood and should protrude about 1/2" to 3/4".

5. Use the dyed string, undyed string, or polyester sewing thread to thread the loom.

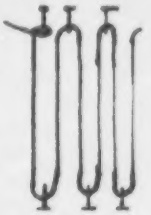
6. Tie the threading material to the top left-hand nail.

7. Bring thread down to nail at lower left-hand corner.

8. Bring thread around left-hand side of corner nail.

9. Bring thread up to second nail at top left.

10. Bring thread around left side of nail and down to second lower nail, as illustrated, being sure there is no slack in threads.



11. Continue until all nails are threaded, knotting the thread at the last nail.

Lesson C. Weaving

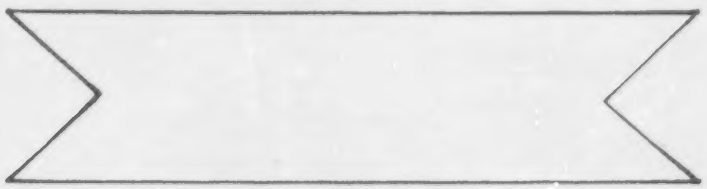
Objectives

Using thread dyed by the student, the student will make a piece of woven material on a weaving loom.

Procedure

To make a bobbin:

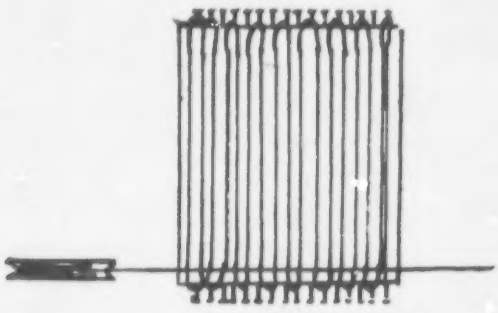
1. Cut notches in each end of a tongue depressor or in a piece of heavy cardboard of the same approximate size, as illustrated.



2. Wrap one color of thread around the bobbin until full, leaving 10" of thread unwrapped.

3. Starting at bottom right-hand side of loom, push bobbin under first loom thread, over second loom thread, under fourth loom thread, over fifth loom thread and so on across the row.

4. When the bobbin is pulled free of the final loom thread, the 10" unwrapped bobbin thread will form the first row of weaving.

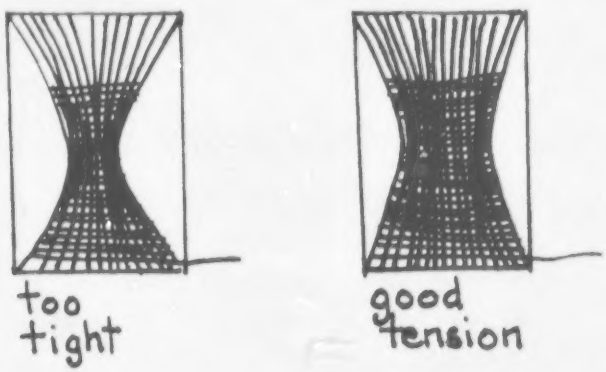


5. Unwrap about 10" of thread from bobbin.

6. Beginning at left-hand side of loom, push bobbin through loom threads going over the loom thread that was passed under in the first row; and going under the loom thread that was passed over in the first row.

7. Pull the bobbin through and pull thread so that it is not slack.

8. The middle of the finished woven material will be somewhat thinner than the ends. This will occur to an exaggerated degree, if the bobbin thread is pulled too tightly at the end of each row.



9. After weaving several rows, push the woven rows down toward the bottom of the loom with the bobbin or fingers to tighten the rows of weaving.

10. To change colors, at the end of a row cut the thread leaving about five inches. Wrap bobbin with next color and continue weaving as before. Knot the two ends (old color and new color) after the first row of new color is completed.

11. When the weaving rows are completed to within one or two inches from the top, the weaving can be tied off.

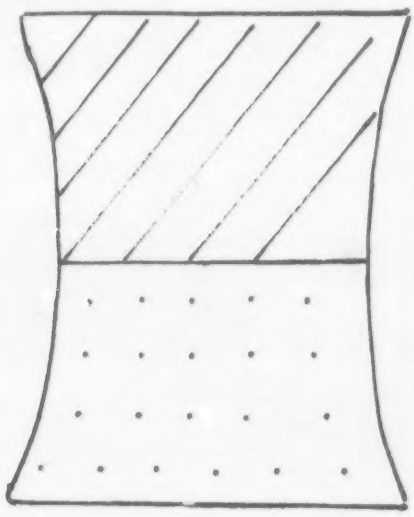
12. Carefully cut two loom threads where they circle the first two nails.

13. Tie two loom thread ends together.

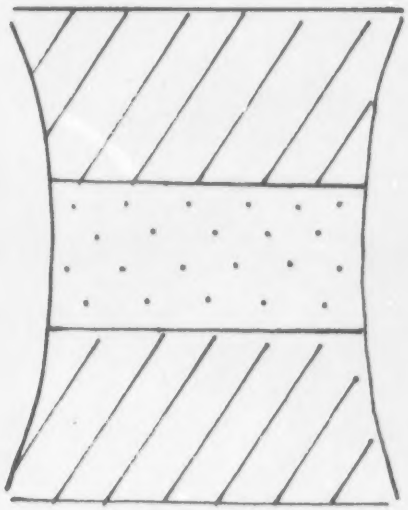
14. Continue to cut and tie two loom threads together until all are tied.

15. Repeat process at top end of loom and woven material is completed.

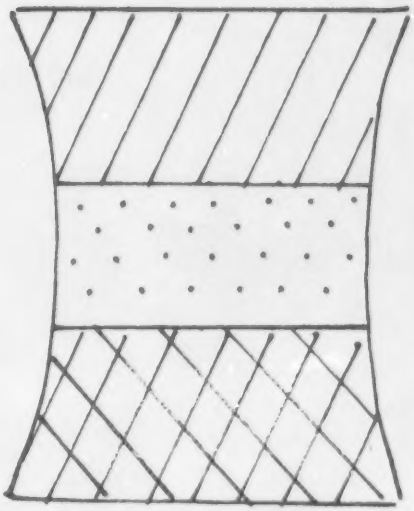
16. Any of the following patterns or variations of these patterns may be used:



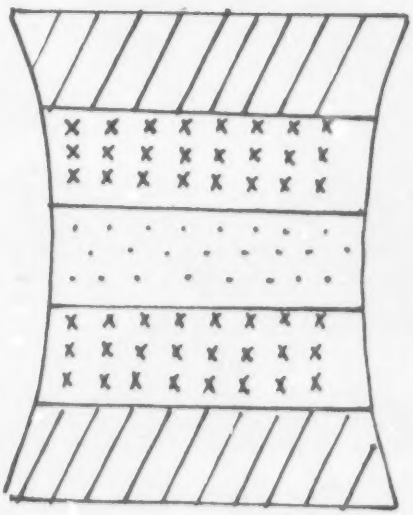
2 colors



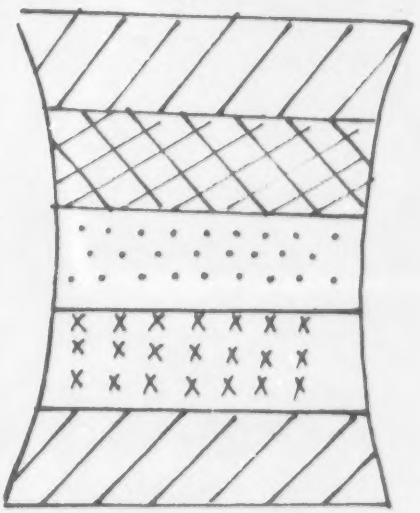
2 colors



3 colors



3 colors



4 colors

Lesson D. Toys: Making Dolls

Objectives

The student will make a doll.

Procedure

CORNSHUCK DOLL

Material needed:

fresh cornhusks and cornsilk

container in which to soak cornhusks

thin wire

paint or thin felt-tipped markers

white glue

1. Remove fresh cornhusks from the cob, separate, and lay in the sun until completely dry.

2. Soak the strips in warm water for 10 minutes or longer to make them pliable.

3. Place five long strips, one on top of another, fold in the middle.

4. To form the head, wrap wire around the husks, one and a half inches below the fold. Pull the wire very tight and twist the ends together securely.

5. To form the arms, place 2 or 3 long cornhusks on top of one another.

6. Fold each end toward the center to make the cornhusks 6 inches long.

7. Roll the cornhusks to form a slim 6-inch roll and use white glue to hold securely.

8. Tie the roll near each end with a thin strip of shuck to form a wrist.

9. Separate the cornhusks below the neck and insert the arms.

10. To form upper body, fold three more shuck strips and insert them under the arm strip.

11. Push them firmly against the arm-roll to hold the arm-roll tightly against the tied neck.

12. To form the waistline, wrap and tie the bundle with wire below the arm-roll and folded husks.

13. Cover the wire at the neck and at the waistline by gluing or tying thin strips of cornhusk over them.

14. Trim the bottom edges of the cornhusks evenly to form the skirt.

15. Glue cornsilk hair to the doll's head.

16. Paint features with water color or thin felt-tipped markers.

17. A bonnet and an apron, cut from strips of cornhusks and glued in place, may be added.

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*Making Gifts from Oddments and Outdoor Materials, Betsey B. Creekmore. Hearthside Press, Inc., New York, 1970, pp. 124-126.

APPLEHEAD DOLL

Materials needed:

apple

thin knife

fur or wool

pipe cleaners

scrap of material for clothing

cotton batting

white glue

pipe cleaner or coat

1 - 20" hanger wire

1 - 16" pipe cleaner or coat hanger wire

tape (plastic or masking)

1. Peel and core a hard winter apple, medium sized.

2. With a thin knife, block out a rough idea of a face in one side of the apple, indenting lines at the sides of the nose area and in places where you want the eyes and mouth. Leave areas above and below the eyes and mouth for the forehead and chin.

3. Bake the apple on a tray in a 200-degree oven for most of one day. When the head comes out, it may still be moist. Place it on a radiator or in the sun for several days until it is thoroughly dry.

4. When head has shrunk and face is recognizable, put a tiny piece of fur on top for hair. Or, cut appropriate colored yarn with scissors into snippets so small that they are fuzzy. Put glue over the entire surface to have hair and sprinkle the chopped wool over the wet glue.

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*21 Kinds of American Folk Art and How to Make Each One, Jean and Cle Kinney. Antheneum, New York, 1972. 38 p.

5. Whiskers are added in the same way.

6. To make the body, bend two lengths of coat hanger wire or pipe cleaners, one 20" long and one 16" long, together at the middle. See illustration.

7. Wrap the four wires tightly at the bend with plastic or masking tape to form a one-inch neck.

8. Spread the two short wires outward for arms.

9. Tape the two long wires together for four inches to form the doll's body.

10. Separate the long wires into legs, and bend their tips at right angles into feet.

11. Pad the limbs and body with cotton batting, securing it firmly with overlapped plastic or masking tape.

12. Cover the feet with black plastic or tire tape, for shoes, and the neck and hands with tan tape.

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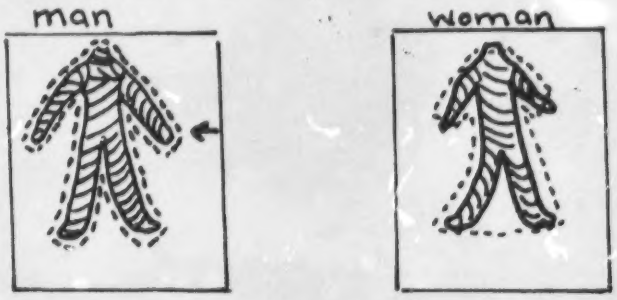
*Making Gifts from Oddments and Outdoor Materials, Betsy B. Creekmore. Hearthside Press, Inc., New York, 1970. p. 122.

13. To dress the doll, fold a piece of material, which is longer and wider than the body and limbs, in half with right side of fabric together.

14. Lay doll on fabric. Draw a line around the doll which is 3/4" to 1" larger than the doll.

15. Holding the folded fabric together, cut out two matching pieces of cloth for the dress or pants.

16. For the man, cut shirt and pants apart at arrow.



17. For all pieces, glue along edges of pattern pieces, right sides together as cut. Do not put glue at neck edge, wrist edge, feet edges or skirt bottom. When dry, carefully turn right sides out.

18. To dress dolls, cut back piece of dress pattern from neckline to waistline. Slip on doll and glue, overlapping cut lines.

19. Follow the same procedure with the man's shirt.

20. Pull the pants on and secure to waist of doll by wrapping wire tightly around top of pants. Twist ends securely.

21. Put dab of glue on neck and insert into head.

22. Bits of lace or other trimming can be glued around neckline, wrist and shirt bottom.

23. Bend doll to desired stance.

24. A hat, bonnet, cap, pipe, apron, rifle, fishing pole, shawl, hair ribbon, egg basket, or cloak may be added.

NUTHEAD DOLL

Materials needed:

2 walnut halves

paint or felt-tipped marker

5 pipe cleaners

1. Crack and remove meat from two unbroken halves of a large English walnut. After decorating, the shells will be glued together to form a head.

2. Paint eyes, nose and mouth on one shell.

3. Paint hair around face and one the other shell, which will form the back of the head. Or glue cornsilk, snipped yarn, stainless steel (from pot scrubber), or pieces of raveled rope to the two shells for hair.

4. The body can be made like the body of the Applehead Doll, using shorter wire.

5. A simpler body can be made by braiding three pipe cleaners to form the body.

6. Wind another pipe cleaner around the body and extend at both sides to form the arms.

7. Wind another pipe cleaner around the lower part of the body and let hang down for leggs.

8. Bend end of legs at right angle to form feet.

9. The doll may be dressed in the same way as the Apple-head Doll.

10. Or clothes can be cut from construction paper (two matching pieces), decorated and glued onto the pipe cleaner body.

11. To fasten the head to the body, put braided pipe cleaner neck into hollow walnut shell. Glue two halves together around pipe cleaner.

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*21 Kinds of American Folk Art and How to Make Each One, Jean and Cle Kinney. Anthenum, New York, 1972. 39 p.

CHAPTER VII

COLONIAL OCCUPATIONS -- COMMUNICATIONS

Chapter VII provides "hands-on" experiences demonstrating a variety of printing techniques. Some of these are used by craftsmen today as well as being used in colonial days.

The lessons may be used in any order. Some or all may be utilized. A variety of experiences have been given to enable the teacher to match his/her needs, the student's ability, and available materials with one activity or another.

The work of the craftsmen of the 1770s and of the 1970s encourages creativity, and individuality while offering satisfaction in return. The finished product serves as the evaluation.

Lesson A. Printing

Objectives

The student will explore several easy methods of printing and will display examples of each.

Procedure

BLOCK PRINTING

Materials:

Wood blocks (size depends upon design)

Glue

Cork (rubber, string, linoleum, etc.)

Glass

Ink (block printing) or other

Scissors or Exacto-knife

Paper (for printing)

Old newspapers

Method:

1. Cut interesting design from cork or substitute and glue on wood block.
2. Allow to dry thoroughly.
3. Place thick pad of newspapers on working area.
4. Roll out ink with brayer (brayer can be a bottle) on a piece of glass.
5. Then bray ink evenly over glued objects.
6. Stamp design on paper that is cushioned with newspapers.
7. Re-ink design and print as many as needed.

MONOPRINT

Materials:

Plastic-topped table, desk or piece of glass

Finger paint

Masking tape

Printing paper

Old newspapers

Method:

1. Define an area on the plastic top with masking tape.
2. Smooth paint with hands or brayer until smooth.

3. With fingers, hands or simple tools made from cardboard, work a design as for fingerpaint.

4. Place a sheet of newsprint or rice paper over design, gently press on inked plate and lift paper for monoprint.

5. As many as three prints may be made from this design.

6. When design becomes too light for transfer, simply add more ink and design another.

EASY SILK SCREEN PRINTING

Materials:

Nylon netting (cheaper than organdy)

Wooden frame

Embroidery hoop or paper plate

Stencil

Ink

Squeege

Newspapers

Printing Paper

Method:

1. Cut a stencil from a piece of newsprint.
2. Paper may be folded for a symmetrically cut design.
3. Place netting over frame.
4. Put stencil under frame on a thick pad of newspapers.

5. Use a cardboard squeege to push the printing ink from the top to the bottom of the frame.

6. The printing ink will pass through the cloth to the paper under the stencil and make the print.

7. The ink will also affix the stencil to the cloth so that more prints may be made with the same stencil as long as it holds together.

8. An alternate frame may be constructed with a paper plate by cutting a window in the paper plate, then fastening the netting with staples and masking tape.

9. The texture of the netting gives an interesting effect to the print.

OTHER EASY PRINTING METHODS

Sandpaper Print:

1. On a piece of fine sandpaper, render a crayon design.

2. Apply the crayon heavily to those areas which would appear dark and lightly to those areas which would appear lighter when painted.

3. Roll an inked brayer over the surface of the crayon-designed sandpaper and place it face down on a piece of print paper.

4. With the back of a tablespoon, using a great deal of pressure, rub over the back of the sandpaper.

5. An alternate method of applying pressure would be to send the print and print paper through an ordinary clothes-type wringer.

Gadget Print:

1. Gadgets make interesting shapes for printing.

2. Such things as bottle caps, forks, rubber erasers, cork, and bits of wood, etc., make excellent tools for printing.

3. Stamp these objects into a temper stamp pad, made with a wet folded paper towel in a saucer with tempera paint and a little glycerine.

4. Allover or repeat patterns are rendered effectively with gadget printing.

Vegetable or fruit prints:

1. Cut potato in half, (or use apple, carrot, orange, head of cabbage, etc.)

2. Either cut in design or paint over surface of article or press them into tempera stamp pad mentioned above.

3. Print face down on paper.

4. Use an allover repeat pattern idea or try overlapping, rotating and inverting the forms.

Lesson B. Colonial Terms

Objectives

The student will make a "dictionary" of colonial terms with illustrations in book form or as a bulletin board.

Procedure

1. Using books found in the library, make a list of terms in common use during the colonial period.
2. Include phonetic spelling of the word.
3. Illustrate where possible.
4. Compile the finished product into book form (Chapter II, Lesson I) or decorate a bulletin board with them.
5. The following list of words and definitions may be helpful:

ordinary - an inn where one ate what was put before him/her

helve - ax handle

gum - tree trunk hollowed out for a barrel

piggin - small pail with one stave left much longer than the rest. Shaped to serve as a handle.

temse - sieve

cooper - barrel maker and bucket maker

hogshead - cylindrical barrel, without bulging midriff

housewright - carpenter who framed out the house

joiner - carpenter who did finishing work on house

millbill - very hard chisel-headed hammers used by millers to recut the dulled grooves in the millstones

fulling - cleaning grease from woven wollen cloth, compacting its fibers, and raising the nap

cat whipper - shoemaker and shoe repairer

botcher - shoe repairer or cobbler

whitesmith - tinsmith

tinker - tinsmith

tinker's pig - cylindrical tool box which the tinker carried on a strap over his shoulder

wheelwright - wheelmaker

loggerhead - a square-ended poker which was thrust, red-hot, into wine to warm it

apothecary - mixed medicines, prescribed them, visited sick, etc.

culter - maker of cutting implements from razors to swords

doublet - coat-like jacket

breeches - knicker-like trousers

clog - shoe

clout - woman's or girl's bandana

pudding - soft pillow worn around a baby's middle to keep him/her from getting hurt

trencher - wooden board that served as a plate

hornbook - a piece of wood with a printed page on each side covered with a thin sheet of horn

keeping room - the main room where the family cooked, ate, slept and worked

settle - long wooden bench with high sides and high back to keep out the chilling winds

jack-bed - short beds used by mothers and fathers to save space

pod - sleigh pulled by one horse

pung - sleigh pulled by two horses

town crier - his job was to walk through the streets and call out the news of the day

watch - foundation of a church steeple, below the belfry and spire

ruggle - wagon brake

pumice or apple cheese - crushed apples ready for the cider press

cratch - corn crib (building for storing corn and grain)

chain - a surveyor's measuring device sixty-six feet long

grike - narrow opening in stone and wooden fences to let people through but not farm animals

sluice box - small canal which fed water from pond to water wheel of a mill

trunnels or tree nails - large wooden pegs for "nailing" building framework together

cat and clay - construction method using sticks and mud, often for chimneys

by hook and crook - legal term forbidding tenant to cut live trees, but allowing hooking or pulling down dead limbs

Lesson C. Writing a Colonial Letter

Objectives

The student will make ink with which to write a letter.

Procedure

Materials:

Bark from maple tree

Goose, turkey, or pheasant feathers

Small amount of sand (1 - 2 cups)

Paper

Small amount of clay

1. Boil the maple tree bark in a small amount of water until the water is a dark shade. This is your ink.
2. Let cool.
3. Use the ink and the feather to write a short message.
4. Sprinkle sand lightly over the paper to dry the ink.
5. Pour the sand back into its container.
6. When dry, fold the paper in thirds (top to bottom) and seal, using several small gobs of clay along the flap.

Lesson D. Silhouette Cutting

Objectives

The student will make a silhouette cutting.

Procedure

1. Materials needed:

   carbon paper

   tracing paper

   manila paper

   black construction paper

   sharp scissors (cuticle scissors work well)

   white glue

   sharp pencil

2. Look through children's books such as Little Golden Books, Mother Goose stories, fairy tales, and Kate Greenaway books for a silhouette pattern.

3. Trace the picture that has been chosen for the silhouette, using a very sharp pencil.

4. Place a piece of carbon paper on a piece of black paper.

5. Place the traced pattern on top of the carbon paper, and trace over the pattern, bearing down. Be careful not to move the pattern. The pattern may be taped to the black paper to keep it from moving.

6. When the tracing is completed, cut the large areas away first, then do the fine details of the silhouette.

7. Use white glue on the silhouette to glue it to the manila paper.

8. Use the glue sparingly and only along the outer edges of the silhouette.

9. The silhouette may be signed with the name or initials of its creator. A short title may also be added. Use a black fine-tipped felt marker.

10. Framing of the silhouette is optional.

CHAPTER VIII

COLONIAL OCCUPATIONS -- TOOLMAKING AND RELATED MANUFACTURING

A large variety of "hands-on" experiences are included in Chapter VIII. This type of learning activity is particularly suited to the needs of disadvantaged students.

Each lesson is a separate entity, so all lessons or some lessons may be utilized according to the needs and abilities of the student and in the sequence most convenient for the teacher. The activities may be completed on an individual basis, in pairs, or as a class project.

The finished product is the evaluation.

Lesson A. Tinkering: Making a Cowbell

Objectives

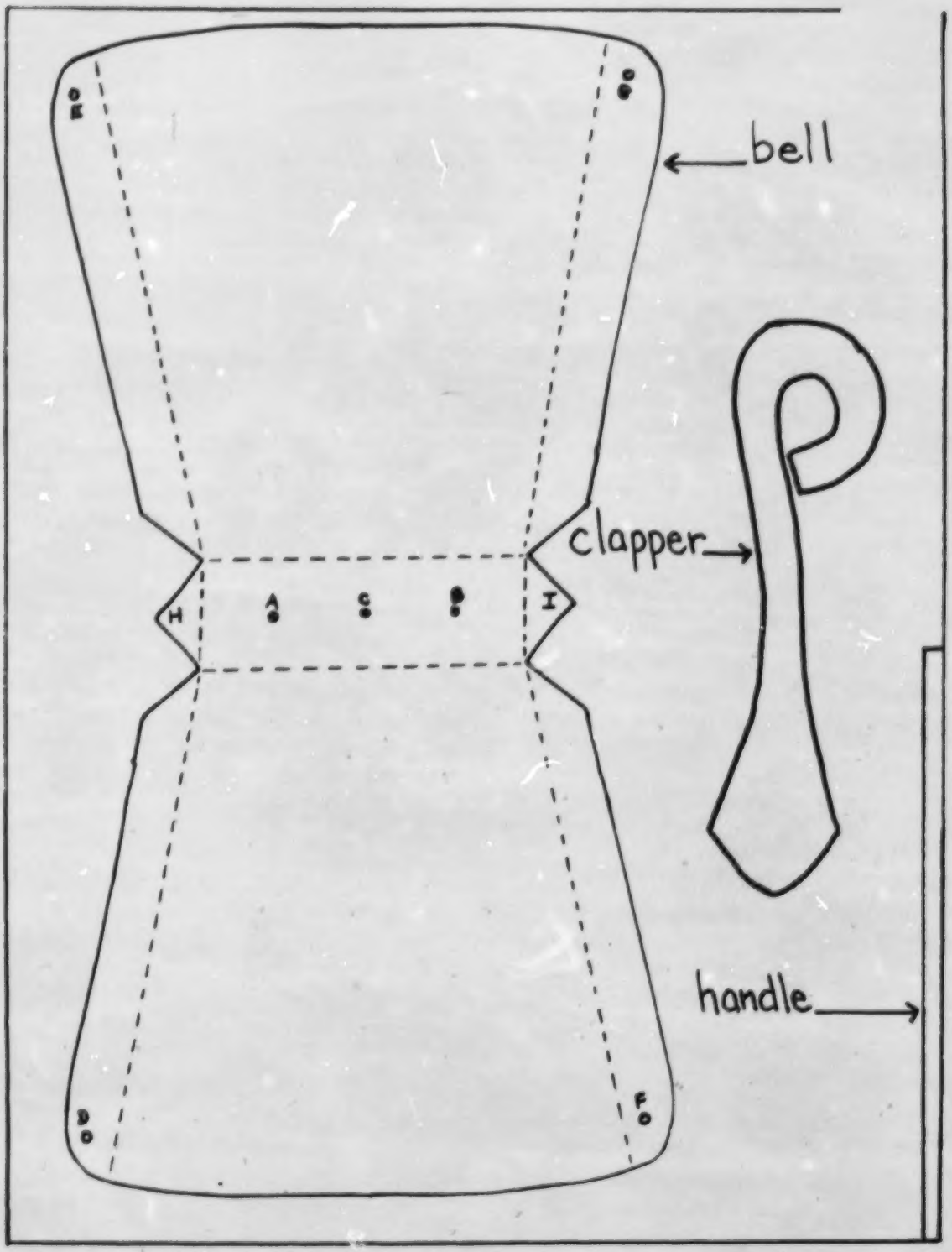
The student will construct a cowbell.

Procedure

Materials:

6"" x 9" flat aluminum foil TV-dinner tray

5 paper fasteners


bell
clapper
handle
E
G
H
A
C
B
I
D
F

1. Place pattern for bell and bell clapper on aluminum tray as indicated.

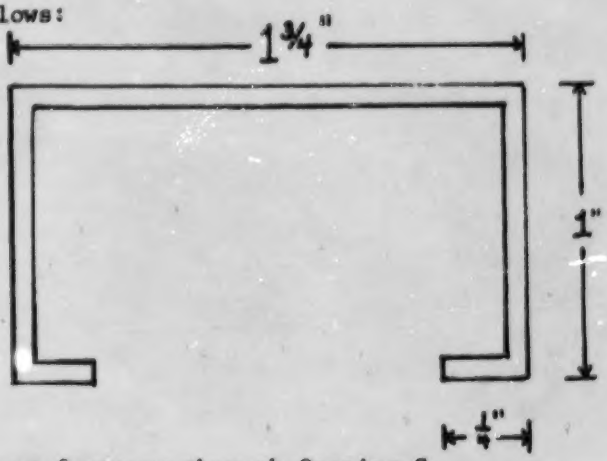
2. Trace pattern with felt marker and cutout.

3. Mark score lines with a felt marker as indicated on pattern.

4. To score, hold a ruler along line. Make a slight indentation on the line with a blunt scissor, a screw driver, or a "closed" ballpoint pen. Fold on each scored line.

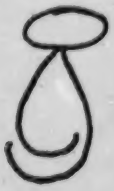
5. Cut a 4-1/4" strip of aluminum foil along the thick rolled edge of the tray as indicated.

6. Bend as follows:



7. Insert a paper fastener through Opening C.

8. Bend the paper fastener as indicated:



9. Place the bell clapper on the bent paper fastener.

10. To attach the handle, put the 1/4" bent ends of the handle through Openings A and B on the bell.

11. Fold the bell so that Openings D and E match. Attach paper fastener.

12. Match Opening F and G and attach paper fastener.

13. Points H and I are folded down last.

Lesson B. Colonial Drill

Objectives

The student will construct a working drill.

Procedure

Materials Needed (the size of the materials may vary)

1 - 24" x 1" rounded wooden pole (broom handle, dowel stick, etc.)

1 - 1" x 2" x 18" piece of white pine

1 - 8" x 8" white pine

1 - 3-foot strip of leather (leather shoelace)

1-1/4" x 1/2" flat piece of steel (or penknife blade)

The Circle:

1. Cut an 8" circle from the 8" piece of wood, using a saw, or the circle may be whittled with an exacto knife.

2. Mark the center of the circle. Use a brace and bit drill to make a hole in the center of the circle that is the exact size of the circumference of the 24" pole.

3. The circle will be stationary on the pole.

4. Sand the circle.

The Pole:

5. If necessary, saw one end of the 24" pole to make it flat. This will be the bottom of the pole.

6. Drill a small hole 1" from the top of the pole. The pole must be large enough for the leather strip to fit through easily.

7. Make an opening in the bottom of the pole 1/2" deep to fit the steel securely into the pole.

8. Drive the steel securely into the pole.

9. Round off (or sharpen) one of the corners of the steel that is protruding from the pole, using a whetstone.

The Handle:

10. Whittle the ends of the 1" x 2" x 18" piece of wood to form handles. See illustration.

11. Drill a small hole 2-1/2" from each end through which the leather can pass.

12. Measure and drill a hole in the center of the handle, which is larger than the circumference of the pole. The pole must pass freely through the handle.

13. Sand the handle.

Assembling the Drill:

14. The wood piece may be stained or they may be left in their natural state.

15. Glue the circle to the pole 6" from the bottom.

16. Put the handle over the top of the pole. It will rest on the circle temporarily.

17. Put the leather through the hole at the top of the top.

18. Put each of the ends of the leather through one small hole in the handle.

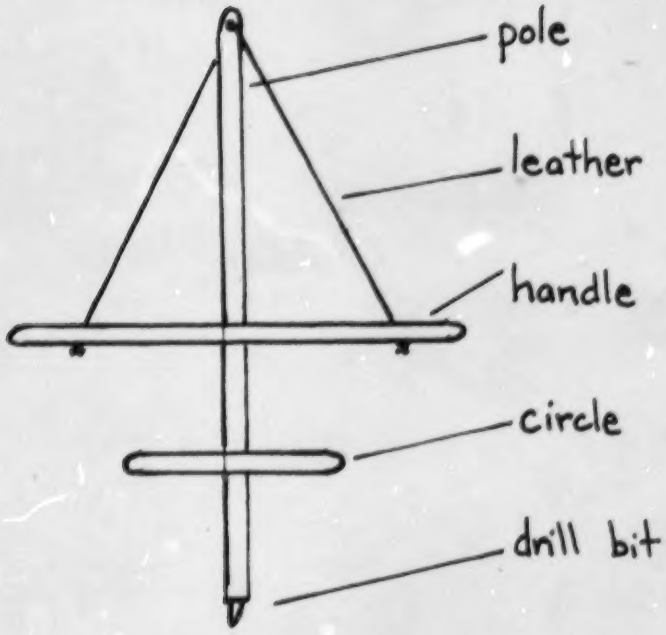
19. Knot the leather securely.

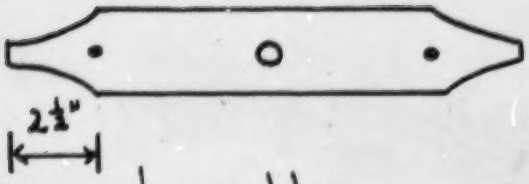
To Work Drill:

20. Rotate the circle until the leather is twined around the pole.

21. Quickly place one hand on each side of handle.

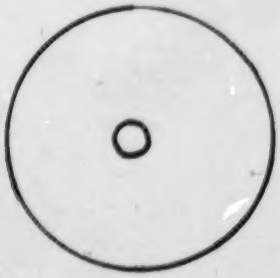
22. Pump the handle up and down the pole to rotate the pole and work the drill.





handle

drill bit



circle

Lesson C. Whittling

Objectives

The student will whittle a fish or other design.

Procedure

Materials Needed:

1" x 6" x 9" piece of pine

carving knife

6" - 7" strip leather shoelace

sharpening stone

stain

varnish or spray

1. Select a piece of soft pine 1" x 6" x 9"

2. Draw the fish on the board, using the illustration, or use a design of your choice.

3. Use a saw to cut away excess wood as illustrated. Use a sharp carver's knife. If necessary, use a jack knife, but be careful as it may close on your fingers.

4. You will need a sharpening stone to keep knife sharpened.

5. To avoid injury, always cut away from your body and away from the hand holding the knife.

6. Make the eyes, mouth, fins and tail of the carving by digging into the wood as you would if you were carving your initials.

7. If the finished product is to be hung up and used as a wall decoration, drill a small hole in the middle of the board.

8. When completed, sand the fish with fine sandpaper.

9. Stain according to your preference.

10. Coat the front and back with several coats of clear varnish according to directions on the can, or spray with clear acrylic spray.

11. Put a 6-7" strip of leather through the hole and knot to make a loop, if board is to be hung.

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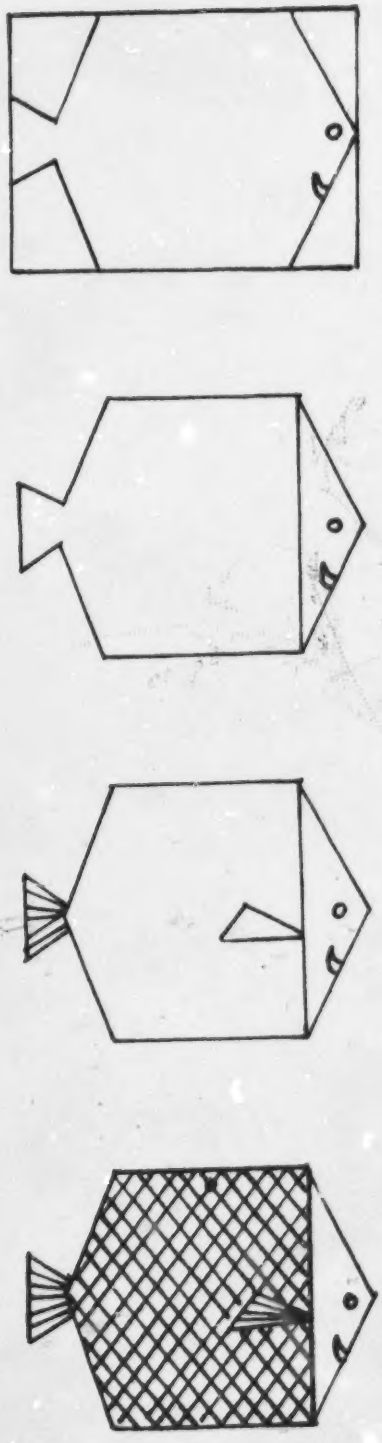
*21 Kinds of American Folk Art and How to Make Each One, Jean and Cle Kinney. Antheneum, New York, 1972. 33 p.



Lesson D. Candle Making

Objectives

The students will make candles.

Procedure

1. Materials needed:

   Large 8" metal juice can with one lid removed, in which to melt the wax. The 8" juice cans make a candle about 6" long. Use a metal juice concentrate can (large size) for a shorter candle.

   Old pot which is larger in diameter than the juice can.

   8" - 12" piece of butcher's cord or other white string for wick (per student)

   1 - popsicle stick or pencil or piece of twig (per student

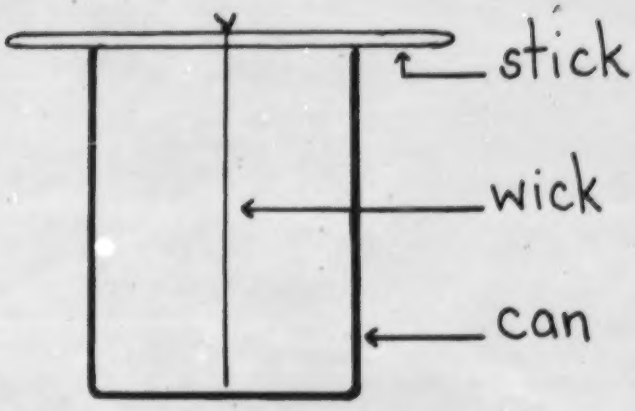
   Hot plate or other heat source.

   Several pounds of wax. (Canning wax can be purchased at the supermarket. One pack should make about 2 or 3 candles. Also, pieces of old candles can be used).

   Newspaper to work on.

   Color or scent can be purchased at a hobby shop or craft shot but are optional (pieces of broken crayons work well as a coloring agent).

2. Tie the length of string or wick securely to the middle of the popsicle stick, twig or pencil. The length of the string can vary according to the size candle desired. The string should reach the bottom of the can when the stick is suspended from the top of the can.



3. Break up the pieces of wax (the smaller, the more easily melted) and old candles.

4. Put wax pieces into the juice can. Pieces of wax crayon may be added for color, if desired.

5. Fill the pot about one-third full with water.

6. Place the juice can into the pot of water.

7. Heat the water over the hot plate or other heat source.

8. The water needs to be hot but does not have to reach a roaring boil in order to melt the wax.

9. Wax is highly flammable, so be careful to watch the melting process throughout.

10. More wax pieces may need to be added. The level of wax must be as many inches high as the candle will be.

11. Remove the pot from the heat when the wax is almost melted (scent may be added).

12. Dip the string into the melted wax, resting the stick on the edge of the can.

13. Slowly remove the wick string. Let excess wax drip back into the can.

14. Let the student go to the end of the line, and let the next student dip his string and so on.

15. Continue this dipping process, by turn, until the candle is the desired size. It takes 30 or more dips.

16. Keep the wax melted. More wax will be needed to maintain the wax level in the can throughout the dipping.

17. Cut the candle off the stick, leaving a 1" wick on the candle.

18. Place in candle holder (optional).

Lesson E. Making a Candle Holder

Objectives

The student will construct a candle holder.

Procedure

1. Materials needed:

   1 - 7" x 4" x 1" piece white pine for each student

   1 - 3" x 4" x 1" piece white pine for each student

   or 10" x 4" x 1" white pine (cut as above) for each student

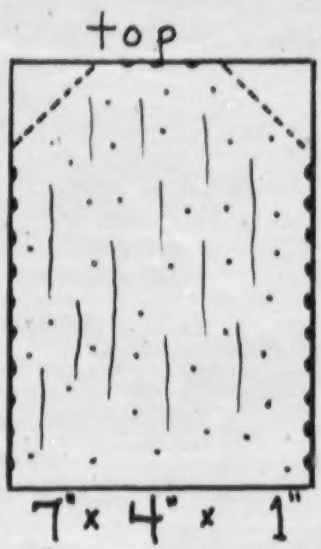
   4 finishing nails

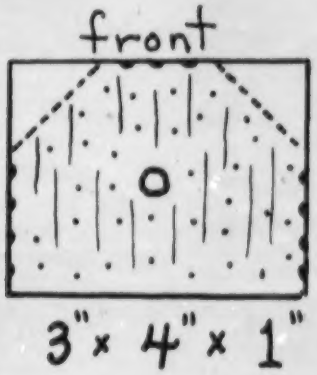
   stain

   sandpaper

   colonial decal (optional)

2. Mark the wood on the corners as illustrated and saw along lines.





3. Decorative notches may be made using a file, as indicated.

4. Sand all edges thoroughly.

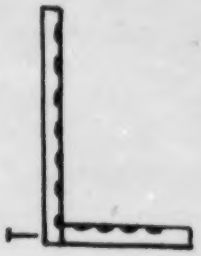
5. To give a distress effect, lightly hammer nail holes at random, as illustreted.

6. Also, a screw driver may be used to make short lines (1" to 3") at random in one direction only, as illustrated.

7. Measure the diameter of the candle which will be used.

8. Using a drill of approximately the same size, make a hole 1/2" deep in the center of the 3" x 4" x 1" piece of wood.

9. Nail thepieces of wood together as illustrated.



10. Stain all exposed surfaces, working stain into distressed holes.

11. When dry, place an eagle decal or other colonial decal in the center of the 7" piece of wood, if desired.

Lesson F. Making a Corn Cob Pipe

Objectives

The student will make a corn cob pipe.

Procedure

1. Materials needed:

   2" section dried corn cob

   5" hollow reed or twig

   utility knife or pen knife

2. Carefully carve an opening into one end of the corn cob.

3. Continue to dig out opening until it is about three-quarters as deep as the cob and about 1/2" to 3/4" in diameter.

4. Carve a hole in the cob in which to insert the hollow reed or twig for a pipe stem.

5. Do not smoke!

Lesson G. Making a Boot Jack

Objectives

The students will construct a boot jack.

Procedure

1. Materials needed:

   12" x 5" x 1" piece white pine (approximately)

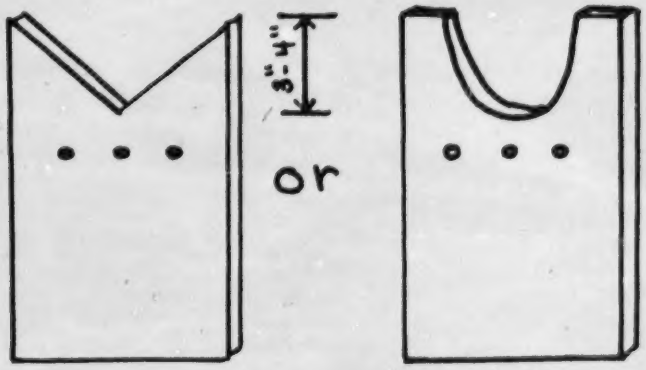
   2" x 5" x 1" piece white pine (approximately)

   3 - 2" screws (or nails)

   dark stain

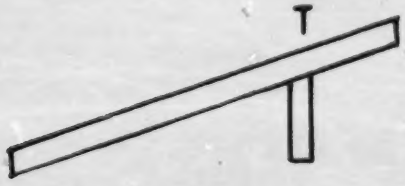
   sandpaper

2. Cut one end of the 12" x 5" x 1" wood as illustrated, according to the tools you have available.



3. Drill holes for screws as indicated.

4. Screw 2" wood to 12" piece as illustrated.



5. Sand entire piece.

6. Stain according to manufacturer's directions.

7. When dry, use boot jack as follows:

(1) place boot jack on the floor.

(2) stand with ball of left foot on boot jack (a).

(3) place heel of right shoe firmly into V of boot jack (b).

(4) pull foot out of right shoe.

(5) reverse feet to take off left shoe.

CHAPTER IX

COMPARING COLONIAL AND MODERN PRODUCTION METHODS

Chapter IX utilizes the actual experience of field trips to provide information which the student can use to make a comparison of the world of work in colonial days and the world of work today.

A lesson has been included which is related to each of the areas covered in Chapters V, VI, VII, and VIII. The areas of food, clothing, manufacturing, and communication form the basis for making a comparison between methods used today and those used during the colonial period.

The cumulative Field Trip Log serves as the evaluation for this Chapter.

Lesson A. Field Trip to a Food Factory

Objectives

The student will visit one or more places in which food is processed. The student will compare modern methods of food processing with colonial methods.

Procedure

1. Contact local food processing plants and arrange for your field trip. Commercial bakeries and dairy food processors are two excellent possibilities for field trips. (Schaible's Bakery, Easton, Pennsylvania; Lehigh Valley Co-operative Farmers, Allentown, Pennsylvania).

2. Ask the contact person (often the public relations person) to send you any pertinent information which would be helpful in preparing the students for the field trip.

3. If possible, visit the field trip site prior to the field trip in order to have a better understanding of the things on which to focus the students' attention.

4. Have each student prepare a Field Trip Log as outlined in Chapter II, Lesson E. Omit this step if logs were made previously.

5. Ditto student worksheets to add to student's Field Trip Log. (See Chapter II, Lesson E.) Items #1-12 of the Sample Field Trip Log can remain the same as they should be pertinent to all field trips.

6. Add items to the Field Trip Log ditto as they pertain to each individual field trip such as:

a. how long in business at that location
b. number of people employed
c. number of different types of jobs
d. kinds of job skills or training required
e. kinds of raw materials
f. kinds of finished products
g. who uses finished products (consumers or manufacturer)
h. length of time required to complete finished product
i. where raw materials come from
j. where finished products are used
k. which kinds of jobs you would like to do
l. which kinds of jobs you would not like to do
m. how does what I saw compare with colonial times, etc.

7. Prepare the students for the field trip with a discussion of the kinds of things they can expect to see.

8. The Field Trip Log worksheet, Items #13 on, can be used as the focal point of the preparation discussion.

9. During the field trip, encourage the students to ask questions about the things they are seeing. You, as the teacher, should also ask questions of your tour guide.

10. The field trip follow-up should include mathematical computation to determine the miles per hour (Log Items #9-11); a general discussion of the field trip; and a discussion and evaluation of the Field Trip Log with emphasis on the comparison of modern methods with colonial methods.

11. Store the log folders for future use.

Lesson B. Visit to a Textile Mill

Objectives

The student will visit a textile mill to compare modern weaving and dyeing methods with colonial methods.

Procedure

1. Contact a local textile mill, if possible, or McGinley Mills, Phillipsburg, New Jersey, for your field trip.

2. Ask the contact person (often the public relations person) to send you any pertinent information which would be helpful in preparing the students for the field trip.

3. If possible, visit the field trip site prior to the field trip in order to have a better understanding of the things on which to focus the students' attention.

4. Have each student prepare a Field Trip Log as outlined in Chapter II, Lesson E. Omit this step if logs were made previously.

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6. Add items to the Field Trip Log ditto as they pertain to each individual field trip such as:

   a. how long in business at that location
   b. number of people employed
   c. number of different types of jobs
   d. kinds of job skills or training required

e. kinds of raw materials

f. kinds of finished products

g. who uses finished products (consumers or manufacturer)

h. length of time required to complete finished product

i. where raw materials come from

j. where finished products are used

k. which kinds of jobs you would like to do

l. which kinds of jobs you would not like to do

m. how does what I saw compare with colonial times, etc.

7. Prepare the students for the field trip with a discussion of the kinds of things they can expect to see.

8. The Field Trip Log worksheet, Items #13 on, can be used as the focal point of the preparation discussion.

9. During the field trip, encourage the students to ask questions about the things they are seeing. You, as the teacher, should also ask questions of your tour guide.

10. The field trip follow-up should include mathematical computation to determine the miles per hour (Log Items #9-10-11); a general discussion of the field trip; and a discussion and evaluation of the Field Trip Log with emphasis on the comparison of modern methods with colonial methods.

11. Store the log folders for future use.

Lesson C. Field Trip to a Factory

Objectives

The student will visit a modern production plant in order to make a comparison with colonial production methods.

Procedure

1. Contact a local manufacturing plant or check the Yellow Pages of the telephone directory of a nearby city.

2. Ask the contact person (often the public relations person) to send you any pertinent information which would be helpful in preparing the students for the field trip.

3. If possible, visit the field trip site prior to the field trip in order to have a better understanding of the things on which to focus the students' attention.

4. Have each student prepare a Field Trip Log as outlined in Chapter II, Lesson E. Omit this step if logs were made previously.

5. Ditto student work sheets to add to student's Field Trip Log. (See Chapter II, Lesson E.) Items #1-12 of the Sample Field Trip Log can remain the same as they should be pertinent to all field trips.

6. Add items to the Field Trip Log ditto as they pertain to each individual field trip such as:

   a. how long in business at that location
   b. number of people employed
   c. number of different types of jobs
   d. kinds of job skills or training required

e. kinds of raw materials

f. kinds of finished products

g. who uses finished products

h. length of time required to complete finished product

i. where raw materials come from

j. where finished products are used

k. which kinds of jobs you would like to do

l. which kinds of jobs you would not like to do

m. how does what I saw compare with colonial times, etc.

7. Prepare the students for the field trip with a discussion of the kinds of things they can expect to see.

8. The Field Trip Log work sheet, Items #13 on, can be used as the focal point of the preparation discussion.

9. During the field trip, encourage the students to ask questions about the things they are seeing. You, as the teacher, should also ask questions of your tour guide.

10. The field trip follow-up should include mathematical computation to determine the miles per hour (Log Items #9-10-11); a general discussion of the field trip; and a discussion and evaluation of the Field Trip Log with emphasis on the comparison of modern methods with colonial methods.

11. Store the log folders for future use.

Lesson D. Communications Field Trip

Objectives

The student will visit a newspaper and/or radio and TV station in order to compare printing and communication of colonial days with modern methods.

Procedure

1. Contact a local newspaper, printing firm, radio station and TV station. Set up field trips to one or to all, if possible. The newspaper and printing firm could comfortably be visited on the same day, one after the other. The radio and TV stations visits could also follow each other to constitute one field trip.

2. Ask the contact person (often the public relations person) to send you any pertinent information which would be helpful in preparing the students for the field trip.

3. If possible, visit the field trip site prior to the field trip in order to have a better understanding of the things on which to focus the students' attention.

4. Have each student prepare a Field Trip Log as outlined in Chapter II, Lesson E. Omit this step if logs were made previously.

5. Ditto student work sheets to add to student's Field Trip Log. (See Chapter II, Lesson E). Items #1-12 of the Sample Field Trip Log can remain the same as they should be pertinent to all field trips.

6. Add items to the Field Trip Log ditto as they pertain to each individual field trip such as:

a. how long in business at that location

b. number of people employed

c. number of different types of jobs

d. kinds of job skills or training required

e. kinds of raw materials

f. kinds of finished products

g. who uses finished products (consumers or manufacturer)

h. length of time required to complete finished product

i. where raw materials come from

j. where finished products are used

k. which kinds of jobs you would like to do

l. which kinds of jobs you would not like to do

m. how does what I saw compare with colonial times, etc.

7. Prepare the students for the field trip with a discussion of the kinds of things they can expect to see.

8. The Field Trip Log work sheet, Items #13 on, can be used as the focal point of the preparation discussion.

9. During the field trip, encourage the students to ask questions about the things they are seeing. You, as the teacher, should also ask questions of your tour guide.

10. The field trip follow-up should include mathematical computation to determine the miles per hour (Log Items #9-10-11); a general discussion of the field trip; and a discussion and evaluation of the Field Trip Log with emphasis on the comparison of modern methods with colonial methods.

11. Store the log folders for future use.

Lesson E. Comparing Colonial and Modern Production Methods

Objectives

The student will compare methods of colonial production with modern production methods to gain an understanding of the advantages and disadvantages of each.

Procedure

1. Discuss ways in which modern production methods are the same.

   A. We have visited production plants and factories. Were they alike in any ways:

      Answer: All used machines.

      Many people work there.

      They make products in large quantity.

      They use raw materials from many places.

      What they produce is used by many people.

      Electricity powered the machines.

2. Discuss ways in which colonial production methods were the same.

   A. We have made many things in the way they were produced during colonial days. How was the production alike?

      Answer: Few machines.

      Machine power limited to horsepower, manpower or water power.

      People worked alone.

      It took a long time to make one thing.

They had to use the raw material readily available.

They used what they produced or it was used fairly locally.

People constructed things carefully with as long a life as possible because they were so difficult and/or time-consuming to make.

3. Make a chart showing the ideas resulting from the above discussion:

COMPARISON OF COLONIAL AND MODERN PRODUCTION METHODS

	COLONIAL	MODERN
How	Much done by hand	Much done by machines
Power Source	Man, horse, water	Electricity
Where	Home or small shop	Factory
Who	Individual	Many
Raw Materials	Those nearby	From all over
Used By	Few	Many
Skills Required	Sometimes much, sometimes none	Sometimes none, sometimes many
Production Time	Slow	Fast
Opportunity for Creative Expression	Often much	Often none

CHILDREN'S REFERENCE

There are numerous books written about the colonial period of American history. Many fine books at all grade levels are available in most public libraries. Those listed below are meant to serve as an example of the types of books which may be useful to the student and to the teacher.

BOOKS

Armstrong, Ezra R., Sr. THE STORY OF MAPLE. E. R. Armstrong, East Hill, Barre, Vermont, 1959.

An interesting, simplified story of maple from early methods to present day. Clever illustrations. Easy reference. Ten pages.

Bernheim, Marc and Evelyne. GROWING UP IN OLD NEW ENGLAND. Crowell-Collier Press, New York, 1971.

An account of a family's daily life in early nineteenth-century New England. The illustrations are black and white photographs taken at Old Sturbridge Village and are excellent. This would make a perfect read aloud story. 97 pages.

Bliven, Bruce, Jr. THE AMERICAN REVOLUTION 1760-1783. Random House, New York, 1958.

Curren, Polly. HEAR YE OF BOSTON. Lothrop, Lee and Shepard Company, Inc., New York, 1967.

Story of Boston and the part it played in American history, including the Boston Massacre, the Boston Tea Party, the Battle of Bunker Hill, and Paul Revere's Ride. Written on a third-grade level. Excellent. 39 pages.

Davidson, Mickie. THE ADVENTURES OF GEORGE WASHINGTON. Scholastic Book Services, New York, 1970.

Fisher, Leonard Everett. THE ARCHITECTS. Franklin Watts, Inc., New York, 1970.

Story of colonial builders and buildings. Text may be too difficult for independent reading. Illustrations are of interest. 46 pages.

Glubok, Shirley. THE ART OF COLONIAL AMERICA. The Macmillan Company, New York, 1970.

Illustrates the rich artistic heritage of colonial America and its reflection of many aspects of life during that period. Vocabulary difficult. Illustrations are of interest. 48 pages.

Ingraham, Leonard W. AN ALBUM OF COLONIAL AMERICA. Franklin Watts, Inc., New York, 1969.

Each chapter of this book deals with a separate aspect of colonial life such as customs, holidays, clothing, arts, trades, communication, colonial heroes, etc. The black and white illustrations include prints, photographs of museum pieces and historic sites, and copies of historic pictures, and are excellent. The text is hard. 85 pages.

Longfellow, Henry Wadsworth. PAUL REVERE'S RIDE. Thomas T. Crowell Company, New York, 1963.

Story-poem of the famous ride. Excellent illustrations. 25 pages.

McGovern, Ann. IF YOU LIVED IN COLONIAL TIMES. Scholastic Book Services, New York, 1972.

Meadowcroft, Enid Lamonte. SILVER FOR GENERAL WASHINGTON: A STORY OF VALLEY FORGE. Scholastic Book Services, New York, 1972.

Merriam, Eve. THE STORY OF BEN FRANKLIN. Scholastic Book Services, New York, 1973.

Pictorial Encyclopedia of American History. THE REVOLUTION FOR FREEDOM: YEARS 1734 TO 1783. United States History Society, Inc. Daveo Publishing Company, Chicago, Illinois. 1962-1968.

Scarf, Maggi. MEET BENJAMIN FRANKLIN. Random House, New York, 1968.

Sloane, Eric. ABC BOOK OF EARLY AMERICANA. Doubleday and Company, Inc., New York, 1963.

An illustrated encyclopedia of all kinds of early American things. Excellent drawings. Limited reading required as the pictures tell the story. 58 pages.

Sutton, Felix. THE HOW AND WHY WONDER BOOK OF THE AMERICAN REVOLUTION. Grosset and Dunlap, New York, 1974.

FILMS AND FILMSTRIPS

Boston Tea Party, The
Walt Disney Film

Building a New Nation Series
Eye Gate Films
146-01 Archer Avenue
Jamaica, New York

Spain in the New World
French Settlements in the New World
England in the New World

Colonial Life in the Eighteenth Century
McGraw-Hill Films
330 West 42nd Street
New York, New York

Colonial Life in New England
Coronet Films
65 East South Water Street
Chicago, Illinois

English and Dutch Colonization in the New World
Coronet Films

Founding of Jamestown
Millington Films (obsolete company)

Shot Heard Round the World, The
Walt Diseny Film Company

Soldiers of the Revolution
Churchill Films
662 North Robinson Boulevard
Los Angeles, California

Valley Forge
McGraw-Hill

War for Independence Series
Encyclopedia Brittanica Films
425 North Michigan Avenue
Chicago, Illinois

Taxation without Representation
Boston Tea Party
Shot Heard Round the World
Bunker Hill
Crossing the Delaware
Valley Forge
Saratoga
Yorktown

TEACHER'S REFERENCES

Adrosko, Rita. NATURAL DYES AND HOME DYEING. Dover Press.

Creekmore, Betsey B. MAKING GIFTS FROM ODDMENTS AND OUTDOOR MATERIALS. Hearthside Press, Inc., New York, 1970.

Farrand, Edward P. MAPLE SYRUP -- TREE TO TABLE. The Pennsylvania State University College of Agriculture Co-operative Extension Service, University Park, Pennsylvania, February, 1973.

Hechtlinger, Adelaide. "Life in Colonial Boston." EARLY AMERICAN LIFE. Volume IV, No. 5, October, 1973. pp. 34-40. The Early American Society, Inc., Gettysburg, Pennsylvania.

Hechtlinger, Adelaide. "Life in Colonial Boston." EARLY AMERICAN LIFE. Volume IV, No. 6, December, 1973, pp. 34-40. The Early American Soceity, Inc., Gettysburg, Pennsulvania.

Kinney, Jean and Cle. 21 KINDS OF AMERICAN FOLK ART AND HOW TO MAKE EACH ONE. Antheneum, New York, 1973.

LaMancusa, Katherine C. SOURCE BOOK FOR ART TEACHERS. International Textbook Company, Scranton, Pennsylvania, 18515.

Polley, Robert L. AMERICA'S FOLK ART. G. P. Putnam's Sons, New York, 1968.

Stoudt, John Joseph. EARLY PENNSYLVANIA ARTS AND CRAFTS. A.S. Barnes and Company, Inc., 1964.

Tunis, Edwin. COLONIAL CRAFTSMAN AND THE BEGINNING OF AMERICAN INDUSTRY. The World Publishing Company, New York, 1965.

CROSS REFERENCES BY ACADEMIC SUBJECT

A. Language

Chapter 1 - Lesson A, B

Chapter 2 - Lesson C, D, E, F, G, H, I, J

Chapter 3 - Lesson A, B, C, D, E, F, G, H

Chapter 4 - Lesson A

Chapter 5- Lesson A, B, C, D, E, F, G, H, I

Chapter 6 - Lesson A, B, C, D

Chapter 7 - Lesson A, B, C

Chapter 8 - Lesson A, B, C, D, E, F, G

Chapter 9 - Lesson A, B, C, D, E

B. Mathematics

Chapter 1 - Lesson A, B,

Chapter 2 - Lesson E, F, G, H, I, J

Chapter 3 - Lesson A, E, F, G

Chapter 4 - Lesson A

Chapter 5 - Lesson A, B, C, D, E, F, G, H, I

Chapter 6 - Lesson A, B, C, D

Chapter 7 - Lesson B

Chapter 8 - Lesson A, B, D, E, F, G

Chapter 9 - Lesson A, B, C, D

C. Social Studies

Chapter 1 - Lesson B

Chapter 2 - Lesson A, B, C, D, E, F, G, H, I, J

Chapter 3 - Lesson A, B, C, D, E, F, G, H

Chapter 4 - Lesson A

Chpater 5 - Lesson A, B, C, D, E, F, G, H, I

Chapter 6 - Lesson A, C, D

Chapter 7 - Lesson A, B, C, D

Chapter 8 - Lesson A, B, C, D, F, G

Chapter 9 - Lesson A, B, C, D, E

D. Science

Chapter 2 - Lesson F, G, H

Chapter 3 - Lesson G

Chapter 4 - Lesson A

Chapter 5 - Lesson A, B, C, D, E, F, G, H, I

Chapter 6 - Lesson A, D

Chapter 7 - Lesson A, C

Chapter 8 - Lesson B, C, D

Chapter 9 - Lesson A, B, C, D, E

E. Art

Chapter 1 - Lesson A, B

Chapter 2 - Lesson A, B, E, F, G, H, I, J

Chapter 3 - Lesson A, B, C, E, G, H

Chapter 4 - Lesson A

Chapter 5 - Lesson G, H

Chapter 6 - Lesson A, B, C, D

Chapter 7 - Lesson A, B, D

Chapter 8 - Lesson A, C, D, E, F, G

Chapter 9 - Lesson A, B, C, D, E

EVALUATION FORM

1. Rating: Objectives

1	2	3	4	5
Objectives - vague unclear, or missing. Those included not useful. Mixes various types of objectives, confusing.		Average, some of the criteria for objectives met, some missing, at times inconsistent. Only partially operational for the classroom teacher.		The objectives are stated clearly. A consistent conceptual framework. Excellent. Useful for a teacher.

2. Rating: Methodology

1	2	3	4	5
Very little help is given on methodology, or methodology is too abstract and complex for most students and teachers. Methodology appears to be unrelated to content and an afterthought in the package. Too active or passive for most students. Teacher required to participate with too many students at every step. Doesn't have appropriate methodology for variety of learning ability among students.		Gives help to the teacher, but would like more. Some students would be able to cope with the suggested methodology, but others not. Doesn't appear to have been tested methodology. Teacher has to work out variety for students with specialized learning difficulties.		Uses a variety of modes in the transactions. Does not chain a teacher to a mode without reason, but provides assistance for different abilities. Teachers will find methodology easy to use and believe students will respond. Methodology is part of goals of instruction and not just vehicle for content.

3. Rating: Organization of materials (scope and sequence)

1	2	3	4	5
Sequence illogical or unstated, teacher is left to puzzle it out. Does not appear to have subjected material to any analysis to build an instructional design. Scope is uncertain, seems to contradict sequence. Little help unintentionally to teacher or children in organizing materials.		Average in organization. Some help but teacher must supply most of organizational sequence. Scope somewhat limited, may be too narrow (or broad). Sequence is not detailed enough and may not be useable with a range of children.		Excellent organization of scope and sequence. Conceptually developed on a consistent theory; task analysis or other appropriate investigation has been done.

4. Rating: Evaluation

1	2	3	4	5
Haphazard in approach. Product and process learning either neglected or confused.		Some examples given range of evaluation limited. Samples given but limited and sketchy.		Many suggestions and helps in evaluation for the teacher. Has reference where appropriate.

5. Rating: Overall assessment

1	2	3	4	5
Poorly designed. Conceptually weak and inconsistent or haphazard design. Does not appear to have accurate assumptions about children who will be using material. Underdeveloped.		Has strengths and weaknesses, but most teachers would find satisfactory. On the balance comes out about average, would need considerable supplementary efforts by teachers. A compromise.		Excellent, one of the best by comparison with other material. Theoretically strong and carefully planned. Show consistent design. Would recommend highly.